

ΑΓΓΕΙΟΛΟΓΙΑ:

Or, A

Description of the Vessells in the body of

M A N,

Of the three kinds, *i. e.*

OF THE

VEINS, ARTERIES, and NERVES,

Especially of those in the Limbs and Habit of the Body :

Whereof there are also given Anatomical Figures,

(the largest and fairest that ever were published with any
ENGLISH Book.)

In three Tractates.

Translated out of the Anatomie of *Adrianus Spigelius*, by
whom these parts are more largely and accurately described then
by other Authors; the more full tractation whereof, being a part
of Anatomie so usefull in order to Chirurgicall Operations, hath been
judged very worthy to be annexed unto this present work.



LONDON,

Printed by *Richard Cotes*, for *John Clark*, and are to bee sold at the lower
end of Cheap-side, entring into Mercers-chappell, 1649.

ATLANTIA

OF A

Description of the Vessels in the body of

M. A. N.

OF THE

OF THE

VEINS, ARTERIES, and NERVES

Especially of those in the Human Body:

Whereof there are also given Anatomical Figures;

(the larger and smaller vessels are distinguished with rays

of light.)

In three Volumes.

Printed at the Anatomical Theatre of the University of

London, by W. Wood, at the Theatre of the University of

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The Preface.



OF how great consequence a more perfect knowledge of Anatomie is to the Art of Physick, and Chirurgery, hath been frequently and abundantly made out by Anatomists, Physitians and Chirurgeons, upon occasion, in their severall writings; though the thing it self speak so plainly in its own behalf, that much need not be said in this kind. The case is plain, that with the like facility and successe may a Mariner, making out some unknown land, steer his course through the main Ocean, where nothing but sea and skie appears, without the help of his Card and Compasse; as a Physician judg of the naturall action, or preternaturall affect of any part of the body; or a Chirurgeon institute any operation about the same, without the Anatomieall knowledge thereof; and therefore no more shall be said to this effect. Anatomie may be very commodiously reduced to four distinct kinds, or distinguished according to so many principall parts. 1. Σπλαγχνολογία, Splanchnologie; that is, the description of the Bowels contained in the three Cavities or Bellies of the body; the lower, middle, and supreme. 2. Οσσεολογία, Osteologie, which is the description of all the bones of the body. 3. Μυολογία, Myologie, being the Anatomieall history of all the Muscles. 4. Αγγειολογία, Angeiologie, describing all the Vessells of the body: i. e. the Veins, Arteries, and Nerves; these last, though having no sensible cavities, being reputed vessells in the account of Anatomists. Now though all these parts or kinds of Anatomie, are needfull both to Physick and Chirurgery; yet are they not all of a like necessity to both: but the first of more absolute necessity to the Art of Physick; the other three, to Chirurgery. And therefore though all four have been treated on by the learned author of this Volume; yet in reason it could not but be advantageous and acceptable to Chirurgeons to have some farther helps in our English tongue, for improvement in the three later kinds before mentioned, or in some of them at least. Now for Osteologie, the parts themselves, or the dry bones are and may be kept at hand, for frequent view and contemplation upon them; whereby their severall Figures, Articulations, and all other particulars observable about them, may be rendred familiar; in order to practice about Fractures and Luxations: and without such Autopsie, much cannot

The Preface.

be acquired by the reading of Descriptions, or sight of Delineations. Toward Myologie, there hath been a peculiar treatise of late published in English, which may be useful in that respect to those who cannot peruse Latin Authors. So that the greatest want seemed to be in that kind or part of Anatomie, which is the last in the Enumeration, i. e. Angeiologie, or the Description of the Vessells; the more exact or particular knowledge whereof, especially of those in the Habit of the body, will appear, upon a true account, more necessary to the exercise of Chirurgicall operations, at greater certainty, and with more security, then the knowledg of the Muscles. Upon these considerations, being consulted by the Publisher of this Work, what peece or Treatise in any kind, of Chirurgery or Anatomy, I thought might to good purpose be added thereunto; I resolved him, that I could think of nothing more advantagious in this kind, then a fuller and more accurate Anatomicall Description of the Veins, Arteries, and Nerves in the body of Man, translated out of the Anatomie of Spigelius; adding also the most usefull Anatomicall Figures, relating to the said Descriptions, of the same largenesse as they are in the Editions of the said Author in folio; which were first taken out of Vesalius, and are the largest and fairest that are extant: the case being here, as in Mathematical instruments, in which, how much the largenesse conduceth to certainty in use, is well known. Accordingly he hath not spared for care and cost, in procuring a Scholar every way competent to translate the Descriptions of these parts, out of the forementioned author; and an able Artificer to cut the Figures. And as the work is now accomplished, I doubt not but good improvement may be made thereof, by such Chirurgeons, as being not able to make use of the Originall, stand in need of such helps, if they will not be wanting to themselves for industry in the use hereof.

J. G.

THE

The first Treatise, Concerning The VEINES.

CHAP. I.

Reckons up the branches or propagations of the vena portæ or the Gate-vein, and explains an Aphorism of Hippocrates, that makes very much to the purpose.



Let us come now to the History of the veins, in which we will begin with the vena portæ or gate-vein, as that which spreads not so wide and far as the common hollow one. For, it is wont to be distributed only through the lowest belly, and not at all to propagate it self out of it; nor does it branch through all the parts of that, but such only as are appropriated to the nutritive faculty, namely the Liver, the bladder of Gall, the Stomach, the Spleen, the Sweet-bread, Kall, Guts, and Mesentery, for the Hollow vein sends its propagations to the rest, as the Reins, Bladder, and those parts which serve for generation. But that the manner of this distribution may be more easily understood, for our better method in teaching, likening the whole vein to a tree, we will divide it into four parts, one of which we will call the Roots, as that part which is in the Liver; another the Trunk, which continues it self on and is not divided; a third the Branches into which the Trunk is divided; a fourth, Twigs or Sarcles, such small veins as the Trunk shoots out at its sides; before it be divided into its branches. Which terms ought diligently to be observed, because we have endeavoured by the propriety of these words to give light to this obscure Treatise concerning the veins. But that they may more easily be committed to memory, and all that concerns this business be written with more brevity, following some very learned later Authors, we will give every part its name from the place of its insertion.

From the outside then of the Liver some very little hairy veins are prolonged towards its inner region, and by little and little meet together into greater branches, so that at length they become five, which again gathered together like roots about the middle of the hollow side of the Liver, but somewhat hinderly near to the back, make a notable stock or Trunk, which at length issuing forth near to those eminencies of the liver, which by the Greeks are termed πύλας Gates, is call'd the Gate-vein, and now deserves the name of a Trunk.

This Trunk parting now from the Liver descends somewhat obliquely towards the left side, under the Gut call'd Duodenum, where above the Rack-bones it gets a firm seat; but before it be divided into branches, two twigs sprout from it; the first of which being very small, arising out of the uppermost and forepart of the Trunk, as soon as it is come forth from the Liver, is scattered into the neck and body of the bladder of Gall, or into its outer coat, with a numerous succession of very little branches, such as we have said above are called hairy veins. This twig is call'd in Greek πύλας, in Latin you may render it vesicalis; the vein of the bladder of Gall. Vesalius says there are two branches, which run through the bladder of Gall, whence they are called by some Cystica gemelle, the twin veins of the Gall, but this makes no great matter. The second twig being greater than the former, but lower, arising from the same fore part and more to the right, is inserted into pylorus or the lower mouth of stomach, into whose hinder part, which looks towards the back, it scatters many small branches, from whence it is commonly called Gastricæ, the stomach-branch, but perhaps for memories sake it may be better termed Pyloricæ, or branch of the

Note that the Letters, which are enclosed thus [] refer to the particular tables at the end of that Treatise, wherein they are set.

Through what parts the Gate-vein is dispersed.

The division of the Gate-vein into the roots, trunk, branches and twigs.

The Roots,

The Trunk,

The twigs, that grow out before the division of the trunk Cysticæ.

Gastricæ.

the lower mouth of the Stomach, because there are others also, which are called Stomach-branches.

The two
branches.

These two twigs being thus propagated, the Trunk runs downwards, and inclining all the way somewhat to the left is divided into two notable branches, a right, and a left one: the left is some thing higher then the right, but lesser; the right lower, but greater: the left spreads it self through the Stomach, the Kell, one part of the colon or colique gut, and the spleen; the right through the Guts and Mesentery that is called *Splenica* or Spleen-vein, or the linear one; this the Mesenterick.

Splenica.
Circles rising
from the upper
part of the
Spleenick-
branch.

Now the Spleen-vein, after it is thus come forth from the Trunk, is carried athwart, being underpropt by the membrane of the Kall, toward the Spleen, into which before it be consumed, it shoots forth certain twigs, both from its upper part, and from its lower; from its upper part one, that ascending obliquely to the left side of the Stomach, that looks toward the back, is divided into three propagations, of which the outermost on either side are conveyed into the Stomach, and presently scatter into more twigs; but the middle one ascending through the same hinder part spreads itself through the upper region of the Stomach, and compasses the left orifice or mouth, round about like a crown, from whence it is called *Coronaria* or *Coronaria*, the Crown-vein of the Stomach. This again sends forth continually some small branches upwards to the end of the Gullet, and others downwards through the Stomach. All this branch is called *Gastricus*, the Stomach branch, because it is the greatest, and most capacious of all those, which come to the Stomach. From the lower part of the Spleen branch arise two twigs; one, which is small, sending forth other little sprigs to the right side of the lower membrane of the Kell, and the colique Gut annexed thereunto, is commonly called *Epiplois dextra*, you may Latin it *Omentalis*, the right Kall-vein. Another answering to that branch, which arises from the higher part of the Spleen-vein, and begets the Crown-vein, is inserted in the lower membrane of the Kall, and presently after its rise is divided into two branches, which parting one from another a great distance beget many other twigs, which are spent upon the lower membrane of the Kall, which like a Mesenterick ties the colique gut to the back, as also upon that part of the colique Gut, which is so tied. It is called *Epiplois*, or *Omentalis postica*, the hinder Kall vein. After the Spleen-branch has thus scattered many twigs, now drawing near to the Spleen it is cleft into two branches, an upper, and a lower one; which are broken into others in the very Parenchyma or flesh of the Spleen. From the upper, sometimes before it enters the Spleen, sometimes when it is already entered, there sprouts forth a double or threefold twig, very famous among the Writers of Physick, which they commonly call *vena brevis* the short vessel, but we the venall, to distinguish it from the Arteriall vessel that answers to it: this is inserted into the left side of the bottom of the Stomach, sometimes also higher, and about the left orifice or mouth. Which is the cause why some Physicians, and commonly Anacronists too have foolishly thought, that the melancholick humor is returned from the Spleen through this vessel back into the Stomach, to provoke appetite. But you may esteeme and bodies, in which it is altogether wanting. From the lower branch, which goes to the nether part of the Spleen, one propagation arises, which being pretty big, and notable is reflected towards the right hand, like the foregoing, and compasses the bottom of the Stomach on the left side, and also sends many little branches to the higher membrane of the Kall on the left side; it is called *Gastro-epiplois sinistra*, the left Stomach and Kall-vein. There is also another notable branch, which is found in most to arise from the lower Spleen-branch; very seldom from the Spleen itself. This is carried downwards, and scattering twigs over all the left side of the colique Gut, goes on further by the whole length of the small Gut, and at length determines in the membranous substance thereof, and in the fundament with many little twigs. Physicians make mention of this very often, and call it *Hæmorrhoidalis interna*, the inner emroid vein, to distinguish it from the outer, which is derived from the Hollow-vein. It is truly and properly called the Emroid vein; I say, properly, and truly, because sometimes they call by that name the veins of the nostrills, gums, and mouth, that cast forth blood, and without pain. In this large sense the Philosopher took it in *de part. animal.* where he makes menstruous purgation also a species of the emroid. But the Emroids properly so called by Physicians are dilatations of this vein in the fundament, caused as well by black and yellow choler, as also by a sure phlegm, as by the melancholick humor. And these are of two kinds; *Cæca*, blind pipes, which cast out no blood; but swell out like the stone of a grape into the fundament or out of it: Others *aperta*, open, which cast out the blood, which they contain. The learned Hippocrates hath left us a peculiar book, a golden one indeed, concerning the cure of these. The remaining part of the Spleen-branch is spent upon the whole Spleen, and therein is scattered into divers and very small propagations, entering the very flesh of it about the hollow, and middle line. And these are the sprigs which grow out of the Spleen-branch.

Coronaria.

Circles rising
from the
lower part of
the Spleenick-
branch.
Epiplois Dex-
tera.

Epiplois postica.
The division of
the Spleenick-
branch.
A propagation
of the upper
branch.

A propagation
of the lower
branch.

Gastro-epiplois
sinistra.

Hæmorrhoidalis
interna.

The Mesenterick vein, or right branch of the Gate-vein is joined to the Mesentery, as soon as it comes from the back, and is divided into two chief branches, which passing through

through the Mesentery betwixt its two coats, are each of them cleft into an infinite number of small branches, and they again into less twigs, which going to the guts make up those veins so famous among Physicians, that are called the Mesaraick-veins. The first of these branches is called the right Mesenterick vein from the right side, wherein it is placed, and is likewise twofold, whence it came to pass, that *Vesalins*, and almost all others, who follow him, reckon three Mesenterick veins. This branch is inserted into the Jejunum or empty gut, the Ileum, or circled gut, the Cecum or blind gut, and the right side of the Colique gut, where it lies next to the reins, and liver; and although both its branches shoot forth many propagations from themselves, so that it is very hard to expresse any number of them, as well because they vary much by reason of their subjects, as also because they do not observe the very same order and course, yet it hath been observed, that for the most part there are fourteen, which afterwards are scattered into an infinite company of other twigs. These when they are come to the guts, only gape with their little mouths into their coat, and enter not the cavity it self, that being compassed about within with a certain crust. But as we have said above, that in most parts of our body, the divarications or divisions of the vessels are attended with certain glandules, partly that they may make the safer progress, partly least they should sink down, and withall the flow and ebb of the blood so very necessary be hindered; so here also the divisions of the vessels, which are scattered through the Mesentery, are bolstered up with certain glandules, which with their propagations observe such an exact proportion; that the greater glandules do sustain the greater branches, and the less the lesser. When these glandules swell with a *Scirrhus* the vessels being prest close together, and the distribution of the chylus through the veins, and consequently of the blood through the body being hindered; there follows a Consumption, and pining of the whole body. The left Mesenterick vein is divided into the middle part of the Mesentery, and also that part of the Colique Gut, which runs from the left region of the Stomach as far as to the strait gut. The hemorrhoidal vein, or inner Emroid vein, of which we spake a little before, sometimes arises from this vein, as *Vesalins* hath observed, which affording some sprigs to the Colique gut, at last running forward through the whole length of the strait gut, determines in the fundament. But before the Mesenterick trunk be divided into these two branches, it first sends forth two propagations, one of which is called *Gastro-epiplois dextra*, or the Right Stomach and Kall-vein, which creeps through the right bottom of the Stomach, before, and behind; as also through the upper membrane of the Kall: the other called by others *Intestinalis*, or the Gut vein, by us the *Duodena*, reaches to the middle of the Gut *Duodenum*; and the beginning of the Empty gut or Jejunum, and descends all along through them.

The right Mesenterick branch.

The left Mesenterick.

Propagations that arise before the division of the Mesenterick, *Gastro-epiplois Dextra*, *Intestinalis*. The first use of the Gate-vein.

The chief use of the Gate-vein is to nourish those parts, which are seated in the lowest belly, and need a thicker and more saculent blood, such as are all those parts, which serve for nutrition. For their blood ought to be thicker, that it might be hotter, when heat is alwayes more powerfull in a thicker body: so then the Roots of the Gate-vein nourish the Liver, the Trunk nourishes the *Pancreas* or Sweet-bread; of the Twigs, the *Cysticus*, or Gall-twig nourishes the bladder of the Gall; the Spleen-branch, all the entrails, which serve for nutrition, except the Mesentery, and the Guts; the Twig *Pyloricus*, or of the lower mouth of the Stomach, the *Gastricus* or Stomach-branch, both the Stomach and Kall-veins; and the short vessell nourish the Stomach. For I do not think that the short vessell was made by nature for the carrying back of melancholick humor to the Stomach; but chiefly for its nourishments sake; when that blood, which is generated in the Spleen, is not melancholy, and excrementitious humor, but rather the best, although somewhat thicker then other blood, and that because the parts that are to be nourished by the Spleen-branch, needed a thicker blood, then they which are to be nourished by the Mesenterick. Both the Stomach and Kall-veins nourish the upper membrane of the Kall; the right and the hinder *Epiplois*, or the Kall-veins, the lower. The Spleen is nourished by those two branches, into which the Spleen-vein is cleft, and which enter its *parenchyma*, or flesh through its middle line: the Mesentery, and almost all the Guts by the two Mesenterick branches; the Gut *Duodenum* by the propagations called *Duodena*; but the empty Gut, the Ileum or circled Gut the blind Gut, or the right side of the Colique, or Colon by the right Mesenterick-branch. The left side of the Colique, and all the strait-Gut by the hemorrhoidal vein; but the middle part which lies under the Stomach, by the hinder Kall-vein. The second use is to attract the *Chylus*, and carry it to the Liver; whose veins are most famous for the making of blood. But the same veins which nourish the Mesenterick branch, do also attract the *chylus*, as we shall shew you hereafter, when we shall insist upon the History of it. The third use is to empty out the excrements from the body through the Guts. Thus we see that the choleric humor is sometimes poured forth out of the Liver through the Mesenterick-branch in the bloody flux, and choleric looseness, and the melancholick dregs through the Emroid vein. The fourth use is to help the concoction of the Liver. Thus we see that the thicker part of the *chylus*, which is called melancholy, is attracted by the spleenick branch, not that the seat of melancholy

The second use.

The third use.

The fourth.

July 21

The explanation of a certain Aphorism of Hippocrates.

is in the Spleen, but that it may be more attenuated, and better concocted by the benefit of the arteries, which are most abounding in the Spleen, and so not disturb, or hinder the concoction, which is famed to be in the veins of the Liver, as it usually happens, that whensoever the Spleen is troubled with any disease, the work of making blood is presently harmed.

But because there has been mention made here of the Emroid veins, it seemed, that it would not be unseasonable if I did refer to this place the explanation of a most excellent Aphorism, which is the twelfth of the sixth Section, when it cannot be understood without the History of Anatomy, and is not so faithfully explained by others, as was necessary. Hippocrates writes in it, *αἰμορροΐδας ἰσθμὸν χερσὶν ἐν μύτῃ πυλαχθῆναι κινδυνὸν ὑδρωπὸς ἐμφυεῖσθαι ἢ πθίον*, that is, he that is cured of old Emroids, unless one of them be preserved, is in danger of falling into a Dropsie, or Consumption. In explanation hereof we will first doubt of the Aphorism, then we will dispute of the manner whereby a Dropsie, or Consumption follows upon the cure of old Emroids. But we may not without cause doubt of the truth of it, because the same Hippocrates in a Book concerning the Emroids, which I think to be very much his own, whatever *Mercurialis* say though otherwise a most learned man, bids us to turn the Emroids, and forbids us to leave any unburnt, but to burn them all. And truly *Actius* in his 14. Book, desirous to reconcile these two places, at those words *ἐν μύτῃ πυλαχθῆναι*, that is, unless one be preserved, being overcome, thinks that a manner of diet is to be understood, not an Emroid, as if Hippocrates should say: Thou shalt not cure one that hath long had the Emroids, unless the Patient will diligently observe a convenient manner of diet prescribed by thee; for otherwise there is danger of his falling into a Dropsie, or Consumption. But *Galen* in his Comment upon that Aphorism writes expressly, that Hippocrates sayes, that unless one Emroid be preserved, such danger will ensue, and makes no mention at all of diet. And, what is more, dayly experience sufficiently witnesses, that such mischiefs do ensue though never so exact a diet be kept, and the reason taken from the manner, wherein they happen, and which we shall presently explain, does abundantly manifest it. Whence it is evident, that these two places of Hippocrates are *λέξις* in controversy, and contradicting one another from this answer of *Actius*. But the right answer will be, if we say, that Hippocrates when he writes in his Book of the Emroids, that for a perfect cure they must all be burnt, speaks not of old Emroids, but of such only as are lately come, or when nature has already endeavoured to expell the humor, which was otherwise purged out of the Emroids some other way, whether it be by issues, or by a Fistula, or some ulcer in the Leg. For such may be very well cured without danger of Consumption, or Dropsie, the rather, if the entrails be yet whole and sound; and especially if a good rule of diet follow. Nor does the cure of all old Emroids necessarily bring on a Dropsie or Consumption, but only for the most part they threaten a danger of these diseases to ensue, for sometimes the melancholick matter being hurried up into the brains, there follows madness, as it happened to *Alcippus*, in Hippocrates 4. *Epidem*. For, sayes he, this *Alcippus* having the Emroids was forbidden to be cured, for after the cure he fell madd, but an acute Feaver following it, he was recovered. For explanation of the second doubt, first let us hear *Galen* for he in his Commentary upon the Aphorism, sayes "That the Emroids come by reason of feculent and melancholick blood, which the Liver drives down to the mouths of certain veins, and so this way being stoppt, and abundance of gross humor burdens the Liver, and stifles the natural heat, which being extinguish't, no more blood is generated, but only water, which nature afterwards driving it into the abdomen, or paunch, makes a Dropsie. But if the Liver send that abundance of melancholick humor to the Lungs, some vessell being broken, there follows a Consumption. This interpretation of *Galen*, besides that it seems very obscure to us, is not altogether agreeable to truth. For first, it is false in my judgment, which *Galen* sets down in his Comment, that it is impossible, that the Emroids should be caused without an abundance of feculent and thick blood; when it may be proved both by reasons, and authority, that they come also from choler and phlegm. By the authority of Hippocrates, who in the beginning of his Book concerning the Emroids, witnesses that this disease is caused in this manner; to wit, when choler, or phlegm falling down into the veins of the Straight-Gut, heats the blood, which is in the veins. For these veins being heated attract the blood out of the little veins, that are near, and when they are filled, the inward part of the Seat swells, and the heads of the veins appear out of it. But by reason it is proved thus, when madneses are caused by phlegm, or choler, as Hippocrates witnesses in his Book *De Morbo Sacro*, the same Author in the 6. Aphorism, 21. professes that that madnes is taken away, if there follow swellings of the veins, or Emroids in those that are so madd. Now the madnes would not be taken away, if melancholick humor did only come forth by the Emroids; for then the cause of the disease would not be purged out. But I my self also have seen formerly in Germany some Noblemen, that were troubled with salt catarrhs, afterwards recovered by a great flux of the Emroids; that I am of opinion, that not only melancholy, but also salt phlegm and choler are wont to be purged out by the Emroids. Wherefore if it happen, that one, who has been long-troubled

bled with the Emroids, be cured afterwards, that choler and phlegm, either breed, obstructions in the Liver, or Spleen, or being gathered together in some plenty by stretching the vessels contained in the abdomen, or paunch, breaks through them, or by their quality corrodes and eats their way out, and makes a Dropsie in the *Abdomen*; or else by raising obstructions in the Liver, and extinguishing the naturall heat, generates much water, and ferous humor in stead of blood, which passing through the veins, make a species of the Dropsie called *Leucophlegmatism*; but if this humor go back to the Breast, or Lungs, it breaks through, or eats out their vessels, and hence follows a spitting first of blood, then of corrupt matter, and from thence at last a Consumption, as *Hippocrates* teaches in his Aphorism. But in this place it is first of all to be observed, that there are two sorts of propagations of veins, which make the Emroids: for there are some propagations of the Gate-vein, of which we have already treated; but there are others of the hollow-vein, which arise from the Iliacall branches, of which we are to speak hereafter. Now if the forementioned humors, whether melancholick, or cholerick, or phlegmatick, and salt, flow through the propagations of the Gate-vein, the internal Emroids are caused, which being cured, the matter flows back into the branches of the Gate-vein, that are scattered through the lower Belly into which the veins being loaden with these humors unburden themselves, and make a species of the Dropsie called *Ascites*. But if they flow through the branches of the Hollow-vein, they cause the external Emroids, and these being cured against the Precept of *Hippocrates*, there is danger of a Consumption to ensue, because from hence there is an easie passage of the peccant matter through the Hollow-vein to the Lungs, then to the Heart. And this is that which we have of a good while observed, that many, who have been long troubled with *Fistula's* of the Fundament, and afterwards cured, through the ignorance of Physicians, have fallen into a spitting of blood, and then into a Consumption. May we remember, that a maid was once cured by us in *Germany*, which had a *Fistula* in the middle of her Hip, and for three years had sought help from many in vain, but being cured she fell at length after three or four months into a spitting of much blood. Although she was scarce ten years old, I let her blood presently in the foot of that side on which she had been troubled with the *Fistula*, and purging her body, and laying on a cauterie near the place, in which the *Fistula* had been, I easily freed her in this manner from imminent danger of a Consumption. This spitting of blood happened from no other cause, but that sharp and cholerick matter, which when it could no longer find a way out by the *Fistula*, got up afterwards to the Lungs through the branches of the Hollow-vein. But *Hippocrates* says expressly, that there is danger of a Dropsie, or Consumption to follow, because it sometimes falls out, that neither of these happen, but rather some other disease insues, as it happened to *Alcippus*, who fell into a madnesse, and from that into an acute Feaver: sometimes also the bloody flux follows, and other mischiefs. Sometimes also it happens, that they who are so cured, are preserved still in health, by abundance of urine, sweatings, remedies, and a good rule of diet.

CHAP. II.

Treats of the superior, or ascendent Trunk of the Vena Cava, or Hollow-vein, and the branches which it scatters through the Head.

THE *EE* are now to consider the other vein, which as we told you is called *Cava*, the Hollow one [a], which spreads it self much wider, then the Gate-vein, as being distributed throughout the whole body. For its office is to nourish all those parts of our body, which conduce not to the concoction of the food, and those parts being spread far and wide, it is necessary, that the Hollow-vein also be very large, and extended to a great length: and because they ought to be nourisht with a thinner, and more elaborate blood, and not so thick and saculent, as that wherewith the Stomach, Spleen, and Gall are nourisht; therefore the blood which the Hollow-vein makes, and carries, is also more pure, thin and sincere.

In delivering the History of this vein, although we are not of their opinion, who derive its beginning either from the Liver, or heart, yet because we must begin our Treatise of it somewhere, we thought fit to follow the received custome of Anatomists, and so for perspicuities sake we shall alwayes speak of it, as if it took its birth from the Liver. It may be added, that it spreads certain roots as it were in the Liver, just like the Gate-vein, in the History of which when for that reason we took our rise from those roots, we may not without cause begin thence also with the Hollow one. But this vein although it run directly through the whole Trunk of the body, and make one very notable stock [D] that is drawn out through the middle, and lowest belly, like one straight line continued, or rather in manner of a channell, or conduit pipe, is notwithstanding wont to be divided into two by reason of the Liver, and so one to be called the Ascendent Trunk, the other the Descendent. For indeed that is not true, to which many perswade themselves, that

The use of the Hollow-vein.

The method to be observed in the History of this Vein.

that the Hollow-vein in its going forth from the Liver, like the great Artery, when it comes out of the heart, is cleft into two Trunks; but if hereafter they be called Trunks by me, you must beleeve, that I do it only for orders sake in teaching. The Ascendent therefore or upper Trunk [A.D.] is that which stands about the Liver, and is terminated about the *Jugulum*, or Hollow of the Neck; but that is called the Descendent one [T.V.] which is beneath the Liver, and reaches down as far as the Legs. For both of them are afterwards divided into branches, of which they of the Ascendent [m and q] are carried upwards to the Head, as the Jugular or Neck-branches; or to the Arms, as the *Brachiales* [G and I] or Arm-veins; these of the Descendent Trunk to the Legs, and are called the Crurall branches. [T]. We will speak therefore of all these in order, so that we first deliver the History of the Ascendent Trunk, then of its branches, that grow up partly to the Head, partly to the Arms, after that we will come to the Descendent Trunk, and its branches, that are digested into the Legs.

The Ascendent
Trunk.

Propagations
of the Ascen-
dent Trunk
Phrenica.

Coronaria.

Azygos.

As therefore we have said, that many little Veins like roots grew out of the Hollow side of the Liver, which alwayes by degrees infered into the greater veins, and all of them at length meeting together about the middle of it did make a Trunk; so in the same manner out of a circuit of the Convex side of the Liver a numerous propagation of veins issues forth, which afterwards meet together in one Trunk. This Trunk makes its way through the nervous part of its midriffe on its right side, and passing through it goes undivided to the *Jugulum*, or Hollow of the Neck, and because it climbs upwards, it is commonly called the Ascendent Trunk by them, who conceive that the Hollow-vein rises out of the Liver. It is much greater then the Descendent, because the upper parts are nourished by it alone; but almost all the inferior parts, that are contained in the lowest Belly, by the Gate-vein. But although it be not parted into any branches, untill it come to the *Jugulum*; yet before that it spreads some propagations at its sides, and of those, three notable ones. The first [e e] is that which is called *Phrenica*, or the vein of the Midriffe, on either side one, and is distributed throughout the whole Midriffe, which is called *epiplex*, with a numerous issue, sending little branches to the neighbouring *Pericardium*, or purse of the Heart, and the *mediastinum*, or partition of the Chest; which when it has now got above, and entered the Chest, it inclines a little to the left hand, and enters the *pericardium*, and being hidden very close over against the eight rack-bone of the Chest, is very strongly infixed into the Right ventricle [C] of the heart; that *Aristotle* did not without cause guess, that it sprung from hence. But before it be so infixed, it sends out another propagation [b b] which is a notable one, and extends itself by the hinder part of the Heart, and the left side of it, towards the forepart, compassing the *basis* of the Heart like a Crown, from whence it is called *Coronaria*, or the Crown-vein of the Heart. This scatters many branches through all the outer surface of the Heart, but especially through the left side, as that which needed a more copious aliment then the right side, because of the continuall, and greater motion there. But because the flesh of the Heart is hard, and solid, it ought therefore to be nourisht with a thicker blood, from whence it is, that this branch grows out of the vein, before it enters the Heart, to wit, when the blood is somewhat thicker, and not yet attenuated in the cavities of the Heart. Near to the originall of this there is a little valve, or floud-gate, which hinders the blood from flowing back to the Hollow-vein, as it might easily do by reason of the continuall motion of the Heart. When the Hollow-vein has now gotten above the Heart, it becomes lesser, and perforates again the *Pericardium*, and forsakes the Rack-bones of the Back, and being got above the Gullet, the rough Artery, and the *aorta*, or Great Artery, (which lean so upon one another, that the Gullet takes hold of the bodies of the Rack-bones, the rough Artery lies upon that, and the *aorta* again upon this) it climbs upwards through the midst of the division of the Lungs, where the right part is separated from the left. But because by this means it could not get to the Back, and the little branches, if it should have sent forth any such, had been very liable to danger of breaking, being so hanged up; therefore it sends forth a third propagation [c c] as soon as it is got out of the *Pericardium* or purse of the Heart. The Greeks call this vein *azygos*, the Latins *sine pari*, or *carens conjuge*, without a companion, or wanting a mate, because in a man there is but one, and it has no companion, or mate on the left side, as other veins have; though in creatures that chew the cud, it is double, and plainly to be perceived of both sides. But it issues forth about the fifth Rack-bone of the Chest out of the hinder part of the Hollow-vein, and the right side, and goes downwards, not directly, but inclining a little toward the right hand is as it were reflected backwards to the Back-bone: but as soon as it reaches the eighth, or ninth rib, it is cleft above the Spine of the Back into two branches, which running downwards passe through the division of the Midriffe, which is betwixt its two productions, and so are spread abroad into the lowest Belly: Of these the left, which is sometimes the greater, hiding itself about the transverse Processes of the Rack-bones, and under the left production of the midriffe and the originall of the first bending muscle of the thigh, is inserted into the left Emulgent, either near to its beginning, or (as it oft happens) into the middle of it. But the right, running on likewise under the mem-
branes

Branches about the transverse processes of the right side, and the right production of the *Septum* or *Midriff*, and the beginning of the same first bender of the thigh, which keeps the right side, is implanted sometimes into the very Trunk of the Hollow-vein, sometimes into the first vein of the Loins: And we are indebted for this observation to the learned *Fallopins*, who would have the matter that is gathered together in the Chest, whether it be watery, or purulent and corrupt, or sanguinous, to be evacuated by the benefit of the left branch of this vein; of which notwithstanding we will say something briefly in the following Book. But this vein in its journey downwards shoots forth twigs of both sides, as well right, as left, of which the right are more notable, and larger, of which there are numbred almost alwayes ten; which run out to as many distances of the lower ribs, and make the inferior *Intercoastall* veins. But I say they are almost alwayes ten, because it happens very seldom, that all the distances of the ribs receive branches from this vein, the two uppermost, to wit, the first and second distance getting their surcles or twigs from the fourth branch, that is presently to be mentioned. But these twigs run straight forwards near to the lower side of the ribs, where there are cavities cut out for them, as we have taught in the second Book. And truly this place is diligently to be taken notice of by Students in Chirurgery, because of the opening of the Chest in the disease called *Empyema*, that they may know that incision is to be made in the uppermost place of the rib, because in the lower the vessels would be harmed to the great endangering of life. But these veins do not run through the whole length of the true ribs, but are terminated together with the bony part. But the propagations of the *Mammary* vein nourish the six distances between the gristles of the seven true ribs, as we shall tell you by and by. Yet in the *Bastard* ribs they run even beyond the Gristles towards the *Abdomen* or *Paunch*, into whose Muscles they insinuate themselves. But there are certain other little branches propagated from the same vein, by which nourishment is derived to the marrow of the *Rack-bones*, and the Muscles, to wit, those about which they are carried: some also are implanted into the *Mediastinum* near to the back. This vein *sine pari* without a companion, being thus constituted, the Hollow-vein ascends to the *Jugulum*, or Hollow of the Neck [D] being supported by the *Mediastinum*, and a certain soft and glandulous body, which the Greeks call *glands*, and is placed in the highest part of the Chest, to defend the divarications of the veins there hanging up from all danger of breaking.

And here the Hollow-vein is first divided into two notable branches [E E] from which all those veins arise, that run as well to the Head as to the Arms, or to certain Muscles of the *Abdomen*. Of these one goes to the right side, and the other to the left, which as long as they yet are in the Chest, are called *Subclavii*, *subclavian* branches, because they go under the *clavicula*, or *Coller-bones*; but as soon as they have gotten out of the Chest, and attain to the Arm-hole, they are named *Axillares*, the *Axillary-veins* [F]. From both of them very many propagations issue forth, some of which arise from their upper part, and some from their lower. In our recitall of them we will observe this order, that they which are nearest to the Trunk, shall be first mentioned by us; and they last, which are farthest from it.

The division of the Hollow-vein into the two *Subclavian* branches.

The first propagation then issues out near the very root of the divarication or division of the Trunk, and is called *Intercostalis superior*, the upper *Intercoastall* vein; [E] there is of either side one, which being very little, and descending along by the roots of the ribs, as far as to the third rib, sends two twigs [F F] overthwart, like the *vena sine pari*, to the two distances of the upper ribs. But if the *vena sine pari* sends its propagations to all the distances (as it sometimes happens) then it is wanting not without cause. Sometimes the same vein arises from the Trunk of the Hollow-vein, before its division into the *subclavian* branches.

Propagations from the lower part of the *Subclavian* branches. *Intercostalis superior*.

Another vein [G] sometimes arises from the fore-part of the bifurcation; sometimes from the root of the *Subclavian* branch, and is double, of either side one: sometimes also only one grows out of the middle of the Trunk, before it be divided; which at length, when it has attained unto the *Breast-bone*, is parted into a right, and a left branch. For Nature is wont to sport, as sometimes in its other works, so especially in the rise of veins, so that they are not spread in all bodies after the same manner. But this is called *Mammaria*, the *Mammary* vein, which, when soever it arises, going toward the fore-part, strives to get up to the higher part of the *Breast-bone*, and descends by the sides of it, and when it is come to the *Breast-blade*, about its sides goes out of the Chest, and runs on directly under the right Muscles of the *Abdomen*, even to the *Navill*, near to which it is joyned by an *Anastomosis*, or *inoculation* [I O] with an *Epigastrick*-vein [G] that ascends and meets it; by the benefit whereof arises that notable sympathy betwixt the womb, and *Breasts* of women, of which we shall speak more hereafter in the eighth Chapter, when we shall insist on that History of the *Epigastrick*-vein. But before it leave the Chest, in its descent, it distributes one branch a piece to the six distances betwixt the Gristles of the seven upper true ribs, of either side, which are terminated with the Gristles near to the end of the bony part of the ribs, in which place we told you that the Branches of the vein *sine pari*, (with the extremities of which these are joyned) were ended. From these

Mammary.

veins,

*Mediastina.**Cervicalis.*

veins, which are distributed in this manner to the distances of the Gristles, some others very worthy of our notice do arise, which are disseminated both into the Muscles, that lye upon the Breast, and into the Paps. Near to these a third [h] arises, and sometimes also grows out of the Trunk, which is called *Mediastina*, because it spreads itself into the *Mediastinum*, or membrane that closes up the cavity of the Chest, being extended all along by it, with the left Nerve of the Midriff. The fourth [i] commonly called *Cervicalis*, or the Neck-vein, is a large vein of both sides which running obliquely upward, and backward, to the Transverse processes of the Rack-bones of the Neck, and climbing up through their holes, (from whence perhaps it might be better named *Vertebralis*) affords sprigs to the Muscles, that lye next upon the Rack-bones. When this vein has got above the Transverse Proesse of the seventh Rack-bone, it derives a notable branch of the *Sinus* or *Canale*; in the Neck, through the hole that is made for the outlet of the Nerves; and then another, when it comes above the Proesse of the sixt Spondyll, or Rack-bone, and again another, when it has left the fifth Spondyll, untill at last it comes to the Proesse of the first Rack-bone, which notwithstanding it does not touch, much lesse does it passe into the Skull, (as *Vesalius* would have it) near which it goes partly to the same *sinus* or *canale*, partly it is distributed into the hinder parts of the Neck. For there are two long *sinus* filled with bloud, which are made out of the hard membrane of the Brain, one of each side, being placed at the sides of the marrow of the Neck. From these little branches are distributed, which nourish the marrow of the Rack-bone, and the neighbouring parts; they begin about the Juncture of the Head with the first Rack-bone, and end near to the seventh Rack-bone of the Neck. These two *sinus*, of which one is of the Right, the other on the Left side, have some communion betwixt themselves by a little pipe, and that a short one, which is derived overthwart from the one to the other, for the most part about that region of the Neck, which is betwixt the second, and third Rack-bones. At last there is a fift vein [l] which arises from the hinder part, called *Muscula inferior*, or the lower Muscle-vein, which is distributed in many branches to the Muscles in the lower part of the Neck, (and so extending the Head and Neck, from whence the vein might be rightly called *Cervicalis*, or the Neck-vein) and also to those in the higher part of the Chest near to the Rack-bones.

Propagations
that arise from
the upper part
of the Subcla-
vian branches.
*Jugularis in-
terna.*
Externa.

From the upper part of the Subclavian branches, whilst the Hollow-vein is yet in the Chest, three propagations issue forth, two of which do very well deserve to be noted, which take their way upward, under the Muscles that bend the Head. The former of the two looks more inwards, and is called *Jugularis interna*, the inner Jugular vein: the other inclines to the outer parts, and is commonly called *Jugularis externa*, the outer Jugular vein. For both of them arise near to the *Jugulum*, or Hollow of the Neck, and ascend by that to the Head. The inner is greater, and the outer lesse in a man; but in Brutes 'tis contrary. But when almost all Appellations are derived, and that best, not from the place, through which the veins passe, but from their inflection; perhaps they might be rightlier named *Cephalice* or *Capitales*, Head-veins. The inner Jugular vein [m] takes its originall near to the joint, by which the Clavicles or Patel-bones are tyed to the Chest, and as soon as it arises, is joined with the *arteria carotis*, or sleepy Artery, and a Nerve of the sixt pair, as companions in its journey, at the side of the rough Artery, and climbing to the Chops, about the middle of the way is parted into two branches, of which one is called the outer, the other the inner branch. The outer is so called, because it comes not into the inner parts of the Head, but being divided into two at the corner of the lower Cheek, distributes one branch to the Chops, and the other near to the Ears, and Face. The inner branch, all the way, is joyned to the *Arteria Carotis*, or sleepy Artery, even to the basis of the Skull, whither when it is arrived on the backside, it is likewise cleft into two branches, but of unequall bignesse. For the first [n] is greater and more hinderly, being carried backward obliquely, which having propagated some twigs to the Muscles under the Gullet, and in the forepart of the Rack-bones of the Neck, through the second hole of the *occipitium* or Nowl-bone enters the Skull with the lesser branch of the *Arteria Carotis*, through which said hole the sixt pair of the Nerves descends: and thus this branch enters the first [1] and second [2] *sinus* of the thick membrane. The second branch [p] being smaller, and more to the forepart, quite forsaking the *Arteria Carotis*, or sleepy Artery, goes to the forepart of the Head, and after that by the way it has bestowed a Circle not very notable upon the Organ of hearing, it enters the Skull through the seventh hole of the Wedg-bone, or *Os cuneiforme*. This is dispersed through the *basis*, and sides of the thick membrane, with a numerous issue of branches, the prints whereof are observed in the inner surface of the bones of the forepart of the Head, as we have said above in the second Book. Wee will call these two branches, because they go to the brain, *Encephalici*, as if you should say *Cerebrales*, of the Brain, and that shall be the greater *Encephalicus*, this the lesser. The externall Jugular vein [q] ascending under the skin, and the *musculus quadratus*, or Square-Muscle, that draws down the Cheeks, by the sides of the Neck, when it comes to the Ear, is cleft into two branches [r] one of which I call *Profundus*, the deep one, because it enters the Muscles, and retires into

*Jugularis
Externa.*

Profundus.

into the more inward parts, the other *Cutanes* the Skin-branch. The deep or inner one [s] in its first divarications meets with Glandules about the Chops, and sends forth propagations worthy of our notice to the *Larinx* or Throttle, and the Glandules, that grow to it, as also to the Muscles of the Chops, and of the bone called *hyodes*, among which that which creeps all along under the tongue, is a notable one, and is scattered into many little branches, which are seen, if the Tongue be lift up, even before dissection. From this deep branch three others arise, which enter into the inner parts of the Head, and the Skull. The first, after it has spread little branches into the Chops, and Mouth, enters the Skull, through the first hole of the Temple-bone. The next [e] passes out of the forepart of the eye through the second hole of the Wedg-bone, at which the second pair of Nerves gets out, and runs with some circles through the thicker Membrane upwards. The third is scattered out of the breadth of the Nostrils through the hole of the *Os cribrosum*, or five-bone into the same Membrane. These two nourish this forepart, to which the third *sinus* reaches not, but ends near to the partition of the Mamillary Processes. But the outer or Skin-branch [u] creeping by the skin of the Head, and stayed up with the Glandules under the Ear, which they call *Parotides*, is divided into two branches; of which the Anterior [x] is carried upward obliquely through the Cheeks to the inner corner of the Eye, distributing little branches by the way to the Nose; and going on to the Eye-brow, is joyned with the remainder of the branch of the other side, and makes the Strait-vein, which they call *vena frontis*, the Fore-head vein, [y] and which in madnesse is opened to very great advantage. To this the *Satyr* alludes, when speaking of a certain foolish fellow, hee sayes, --- *Mediam pertundite venam*.

The other or Posterior branch is carried behind, and sends branches to the Temples [z] and skin of the Back-part [a] of the Head. A third vein, which arises out of the upper part of the Subclavian branches, is commonly called *Muscula superior*, the upper Muscle-vein, in relation to another of the same name arising out of the lower part. It issues out near to the external Jugular vein, and is dispersed into the Muscles, and skin of the back-side of the Neck, in regard whereof we shal not do amisse to call it *Cervicalis superior* or the higher Neck-vein [β]. But now let us return to the distribution of the Subclavian-vein, from which we have digrest. This vein, as soon as it gets out of the cavity of the Chest, is called *Axillaris* [F], and when it comes to the Arm-pit, is divided into two notable branches, called *Cephalica* or Head-vein [G] and *Basilica* [I], which are afterward disseminated throughout the whole Arm. But before the Axillary-vein be thus divided, it sends forth two twigs: the first [γ] is called *Scapularis interna* the inner Blade-vein, and is distributed through the Muscles on the inside of the Shoulder-blade: the other [δ] is named *Scapularis externa*, or the outer blade-vein, it is a pretty big one, and is implanted into the Muscles of the outer, and gibbous part of the same Shoulder-blade. But the vein *Basilica* also, before it enters the Arm, shoots out two propagations; one called *Thoracica superior*, or the upper Chest-vein [ε] because it arises out of a higher part then the following, it is a very notable one, and runs through the inside of the pectorall Muscle that brings the Arm forward to the Brest; it distributes branches also to the other Muscles of the Brest, as also to the Skin of the Dugs in women. The other is called *Thoracica inferior*, the lower Chest-vein [ζ], a great and notable one likewise, which descending along the side of the Chest is distributed especially through the third broad Muscle or *Latissimus* that moves the Arm backward, scattering many little branches from itself, which afterwards are joyned by *Anastomosis* or inoculation, with the branches of the vein *sine pari*, that fall out of the Chest. And this vein sometimes grows out of the former, or the upper Chest-vein. These branches being thus distributed, the Axillary-vein reaches into the Arm.

CHAP. III.

Shews how the Axillary-vein is distributed through the Arm.

THe Axillary-vein [F] therefore is cleft into two branches, as soon as it comes near to the Arm, but those branches are of different bignesse. For the upper [G] which they call *Cephalicus*, the Head-branch, is smaller; but the lower vein [I] called *Basilica*, is almost thrice greater. The *Cephalick* also is as it were wholly just under the skin, & sinks not with above one branch into the deeper retreats of the Muscles; wherefore it has neither Artery, nor Nerves for its companions, they being addicted to the more inward rooms of the body. But the *Basilick*-vein partly creeps on under the skin, partly hides itself under the Muscles, and therefore it ought with good reason to exceed the other in bignesse, as being destined for the nourishment of more parts. It hath both Nerves, and Arteries as companions in its journey, which is the cause, why upon the cutting of this vein the blood spins out with a force; but of the

contrary, the Cephalick being cut, it comes forth softly: which we see some Physitians unskillfull in dissections, standing by whilst the vein is opened, foolishly refer to the strength, or weaknesse of the mind, or body. We are now to speak briefly of the manner of the distribution of both these veins through the Arm, beginning from the upper, as the lesser branch.

The Cephalick vein.

The *Cephalica* [G] therefore is called by *Vesalius* *Humeraria*, or the vein of the Arm, because by the Arm it descends into the Hand; by others *Cubiti exterior*, the outer vein of the cubit, from its situation, because it runs on the outside of the Cubit, as the *Basilica* contrariwise does on the inside. By some later writers it is commonly called *Cephalica*, the Head-vein, because it is wont to be opened in diseases of the Head, through the error of the Ancients, who thought ignorantly, that it arises from the external Jugular vein, and therefore empties the blood immediately out of the Head. But it arises from the upper part of the Axillary vein, & climbing over the Tendon of the *Serratus minor*, or lesser Saw-Muscle, that bends the Shoulder-blade forward to the Breast, it runs betwixt the Muscle called *Deltoides*, which lifts up the Arm, and the beginning of the Pectorall Muscle, which brings it forward to the Breast, where it arises from the Clavicle or Coller-bone, and so it runs down by the Arm to the outside of the first Muscle that bends the Cubit, which they call *Biceps*, or the double-headed Muscle; by reason whereof the more learned Chirurgeons have wisely used to make issues betwixt the Muscles *Biceps*, and *Deltoides*; for issues ought always to be made at the seat of some notable vein, that the matter may more easily be voided out. But although this vein be not divided into branches, whilst it is thus carried down by the upward part of the Arm, yet it scatters some twigs [u and e] of both sides into the aforeaid Muscles, and the skin. At length when it is come to the Cubit, it runs under the fleshy Membrane, as a vein under the skin should, and so presents itself to the sight without dissection. But about the very joint of the Cubit at the externall protuberation of the Arm, it is wont to be divided [H] for the most part into three branches, an outer, an inner, and a middle one. The two former run under the skin, the third deeper.

Three branches of the Cephalick vein.

The first or middle one, [i] which is often wanting, is very little, and deeper, and penetrates into the substance of the Muscles, especially of those two, that bend the second, and third joint of the fingers, as also of the long *supinator* of the *Radius*, or wand of the Arm. The second [x] and inner, and chief of the three branches is carried down obliquely under the skin, and joins with the inner branch of the *Basilica*, three fingers below the joint of the Cubit, with which it makes up the vein, that Physitians call *Mediana*, the middle vein [A]. This running down obliquely by the middle Region of the Cubit, distributes many Circles to the *Radius* or wand, and at length itself is divided into two lesser branches; of which the outer [p] goes to the inside of the wrist, toward the thumb; the other and inner [σ] runs to the fore, and middle fingers. The outer of these is called by some *Cephalica manus*, and is opened to very good purpose in diseases of the Head, or Teeth. Now the third branch [n] or outer Cephalick-vein climbs up to the Muscle called the long *supinator* of the *Radius*, or wand, dispersing divers little veins into the skin, and so is carried obliquely [r] through the *Radius*, or wand, and having attained to the middle of its length enters the outside of the Cubit, and in that same place is joyned with a little branch [r] of the Basilick-vein; being united thereto it goes on to the outside of the wrist; and distributes veins to that part of the Hand, which lies before the little, and Ring-fingers, as also to the fingers themselves. This vein, especially that, which respects the little Finger, is commonly called *Salvatella*, and the Section of it is much commended by Practitioners in Physick in melancholy diseases. Which being sometimes called in question, and I having observed, that experience does favour those Practitioners, endeavoured to find out the cause, and found that there are many inoculations here of this vein with the Arteries, as the inoculations are usually more frequent about the extreame parts, as being more removed from the fountain of heat, and therefore wanting a hotter, and more spirited blood. This vein therefore being cut, because the Inoculations are so near, it cannot be, but that the blood of the Arteries should be also let out, which cannot be so well done by opening the veins of the Cubit, because the *Anastomoses* or Inoculations are somewhat more distant from the place, in which the vein is opened. And hence it is, that the blood, which is emptied out of the Hand, is much fairer and redder, then that out of the Arm, because the Arterious blood there always runs out together with that of the veins. But there being six times more Arteries, then there are veins in the Spleen, it is necessary, that its diseases be much helped, when the peccant blood is drawn out of those vessels, wherein it was.

Salvatella.

The basilick vein.

The other branch of the Axillary-vein, that is the inner, and greater, is the *Basilica* [I] which according to its situation in different arms hath found different names among writers practised in Physick. For in the right arm it is called *Hepatica* or the liver-vein; but in the left *Splenica*, or the spleen-vein. They choose that to be opened in diseases of the liver, this in diseases of the spleen. But it issues forth under the armpit, and dispersing many propagations to the Glandules, that are frequent thereabout, it is carried down by the upper part of the Arm to the side of the double-headed-Muscle, or *Biceps*, between the Muscles that

that bend and stretch out the Cubit, and not far from its egress out of the Chest, is divided [K] into two notable branches, of which one is called *Profundus* or deep, the other *Subcutaneus*, or branch under the skin, from their site, and progresse. The deep one or *Profundus* [L], which for the most part is the thicker, all the way it goes, penetrates into the more inward parts of the Arm; having the Axillary Artery, that runs into the Arm, every where for its companion, as also the fourth branch of the third Nerve of the Arm. But it is carried betwixt the two Muscles, which bend the Cubit, and, having past its joint, is clef[t] [M] into two branches; of which the outer [N] near to the *radius* or wand, (from whence it might be called *Raditus*) goes down to the Hand, and scatters little branches toward the Thumb and Fore-finger, as also the middle one; but the inner branch [O] passing near to the bone of the Cubit, (from whence it deserves the name of *Cubitus*) distributes small branches to the middle, and little fingers; but as the outer sends its propagations to the Muscles on the outside of the Hand; so the inner to those on the inside. The other is the branch *Subcutaneus*, or under the skin [P] which is carried down by the inside of the Arm, scattering divers little branches to the skin, and parts adjacent, but when it is come to the inner protuberation of the Arm, it is divided [Q] into an outer, and inner branch, like as the Cephalick is. The inner [R] is carried down obliquely, beneath the bough of the Arm, and being united with the inner branch [x] of the Cephalick, makes the vein called *Mediana*, [A] of which we spake before. But the outer [S] near to the inner protuberation of the Arm being divided into two branches, is carried by the greater along the Region of the *ulna* or ell downward to the wrist, and scatters itself into the little Finger, but by the other it is derived to the inside of the Hand.

The branches
of the basilick
vein.
Profundus.

Subcutaneus.
Its division into
an outer and an
inner branch.

But in this place it is worth our pains to advertise with other the most learned Anatomists; that it ought not to be believed, that the same order, and course of veins is to be found in all men; when the dissection of bodies does demonstrate, that scarce two in a thousand do accurately observe the same distribution of the veins. Wherefore we ought not to be so scrupulous in choosing out places for the openings of veins, as some that are unexperienced, are wont; but to choose that vein especially, which may be most safely opened, because it is best seen. For sometimes the Cephalick or Head-vein is so small, that it can hardly be discerned; and sometimes on the contrary the Basilick is so. Wherefore he shall do best, who will rather follow wise counsell, then the scrupulous opinion of unskillfull men.

CHAP. IV.

Explains the lower, or descendent Trunk of the Hollow-vein.

WE have done with the upper Trunk, and branches of the Hollow-vein, it remains now, that we treat also of the lower. Neverthelesse (as we have above also admonisht) they are not indeed two Trunks, as *Galen* would have them, but one only which reaches in one continued line from its division about the fifth Rack-bone of the Loins [V] as far as to the *Jugulum*, or Hollow of the Neck [D]: but, for methods sake in teaching, we thus divide it by reason of the Liver, which standing as it were in the middle of it, seems to part it into an upper, and a lower Trunk. As therefore that is the upper one [AD] which runs up from the Liver to the Hollow of the Neck; so that is the lower [TV] which beginning at the same Liver is terminated at the *Os sacrum*, or Holy-bone. And as the upper did run on undivided through the Chest, scattering only some propagations at its sides; so the lower also slides down intire through the whole *Abdomen*, or paunch, only some twigs sprouting from it. But when it has attained to the fifth Rack bone of the Loins, it is clef[t] into those two notable branches called *Iliaci* [XX] as the upper is into the Subclavian, which Iliacall branches afterward reaching into the Legs make the Crurall-veins; as the subclavian carried into the Arms make the *Brachiales*, or Arm-veins. Let us speak therefore in this Chapter of the Trunk, and its propagations, as long as it yet is in the lower belly. Then let us come to the crurall branches.

The inferior
Trunk of the
Hollow-vein.

From the descendent Trunk then [TV] before it part into branches, arise four veins. For as soon as it is come forth from the hinder part of the Liver, it declines to the right side of the Back, and sends forth a propagation from its own left side which they call *Adiposa sinistra*, the left fatty vein [v on the left side] because it passes to the fat and outer membrane of the Kidneys, which arises from the *Peritoneum* or Rim of the Belly, as also to the Glandule, that grows above the Kidneys. There is another [v on the right side] answering to this on the right side, but which does very seldom grow out of the Trunk, but rather from the upper side of the middle part of the Emulgent vein; and because it is distributed in the same manner as the left is, it is called *Adiposa dextra*, the right Fatty vein. Yet sometimes you may see the contrary also to happen, and this right vein to

Four propaga-
tions arising
from the Trunk
before its divi-
sion.
Adiposa.

Emulgents.

The place in
which the
stones of the
Kidneys are
bred.

Why the left
Kidney is more
subject to the
stone, than the
right.

Spermatice.

come forth of the Trunk, and the left out of the Emulgent. For there are divers sportings of nature to be seen in the veins; and you cannot easily meet with a dead body, in which you may not find something new, and differing from others. After this the Hollow-vein passing on, when it comes beyond the middle of the back, about the first Rack-bone of the Loyns, it brings forth a second pair of veins [o] very notable, which hastens directly to the Kidneys, upon whose substance it is wholly spent. And hence it is called *Renale*, the pair of Kidney-veins from its insertion; but from its use *Emulgents*, because the Kidneys seem by this pair to milk out the wheyie or serous moisture in the blood, and to draw it to themselves. It is therefore very thick, but yet short, and not of equall length, nor rising directly opposite each to his fellow. It is short, because it did not need length, which for the most part is given by nature to vessels for some previous preparation. It is unequall, because it was fitting the left should be longer than the right, by reason that it was necessary to bring the spermatice vein out of it. But the beginning of both answers not directly one to another, lest one should be hindered by the action of the other. And the left is higher than the right, because the left Kidney is also seated higher, than the right. But the Emulgent branches, as soon as they arise out of the Trunk, do not presently go to the cavity of the Kidneys, but are first divided into two greater branches, and so, accompanied with Arteries, enter the concave side of the Kidneys, and afterward being broken into lesser branches are scattered quite through the whole substance of the Kidneys, and at last determin with their small hairy ends in certain fleshy processes, which they call *Mammillares*. These veins do serve not only for the bringing of nourishment to the Kidneys, but also for the carrying down of the serous moisture to those fleshy Processes called *Mammillares*, through which it is strained into the pipes of the Ureters, and then gathered together into that cavity of theirs called the *Pelvis*, and so drops down by little and little into the bladder, as we shall shew, when we open the History of the Kidneys. And here the place is to be noted, in which the stones of the Kidneys are wont to be generated, which is not in the Emulgent vessels, I mean veins, or Artery; but rather in the very cavity of the Kidneys, or in the *Pelvis*, and pipes of the Ureters. For in these if a viscous matter be at any time received, either it is hardened there by reason of a notable heat, or else through cold is congealed into gravell or stone. For this matter is not only a crude, and uncocted kind of blood, which like snivell sometimes is wont to abound in the masse of blood, but oftentimes also that excrementitious phlegm which falls down from the Head, through the veins and Arteries, both into the Hollow-vein, and the great Artery, and sometimes into the Stomach, and Guts. Of which this seems to be a manifest sign, that they who are subject to diseases of the Stone, are very often troubled with rheumes, and pains of the Colique; of which whilst some perswade themselves that it is caused by wind, daily experience hath taught me, that it comes from phlegm; because I have observed, that they, who are troubled with the Stone in the Kidneys, had their Colon or Colique-gut alwayes stufed with plenty of this phlegm, and that this being taken away, the Stone has been no longer bred. And therefore oft-times I give scouring Clysters, and such as gently purge phlegm, not only to such as have the Stone already, but also to such as are threatned with the breeding of it, with a great deal of benefit to the Patients. But all those things are perpetually to be avoided, which drive out the Stones, as well because most of that nature are hot, as also because they are able to drive down the crude matter plentifully to the Kidneys. We thought fit therefore to insist upon this, that we may accommodate the study of Anatomy to the very practise of Physick; especially seeing that the place, wherein the Stone is bred, is not commonly known, because the most famed *Fernelius*, whom the greatest number of Physicians does for the most part follow, *Lib. 6. Patholog. c. 12.* thinks that small gravell is bred in the proper substance of the Kidneys, and washed from thence by the flowing of the Urine, and carryed into the cavity, and so the Urine full of gravell slides down through the Ureters into the Bladder. But if any one enquire also the cause, why the left Kidney is more subject to the Stone, than the right; we must conclude, that this happens, because the Colique-gut lies more upon the left Kidney, in whose cells this phlegm, of which we spake, abounding, either it sweats through the pores, and is sucked into the Kidneys; or else by reason of its nearness, the Kidneys are exceedingly cooled; experience having often taught us, that this kind of phlegmatick matter is indeed actually exceeding cold in the body, as they have sufficiently perceived, who have voided it in great plenty by Stool. After this there follows a third pair [x and y] called *spermatice*, or *seminales*, the spermatice, or seeds veins, because they carry down matter for making of the seed. These differ in their originall. For the left [y] arises from the inside, and middle part of the Emulgent, and communicating some furdles to that part of the *Peritoneum*, or rim of the belly, which covers the Muscles, that lie in the Loins, it goes fast by the said *Peritoneum*, and descends obliquely; but, when it has attained to the *Os pubis*, or the Share-bone, riding over it, it passes through the *Peritoneum*, and holes of the oblique and transverse Muscles of the *Abdomen*, with whose processes being sustained it is concocted into certain varicous

varicous circlings, which are joined with the spermaticall Artery by *Anastomoses* or Inoculations, and at length it ends in the Testicle of its own side. But the right spermaticall vein [X] arises not out of the Emulgent, but the Trunk itself, and the forepart of it, a little beneath the Emulgent-vein, and afterwards observes a like course with the former. And thus they are in males, though we may observe nature oftentimes varying in them: but in women, although they arise in the same manner, and observe the same course with those in men, as far as the Holy-bone; yet they fall not out of the *Peritoneum*, nor reach unto the share-bones, but before they come to the Testicles, are cleft into two unequal branches; the lesser of which is scattered into the sides of the Womb, toward the bottom of it; the greater being joined to the spermaticall Artery, and inoculated with it, enters into the Testicle of its own side. Last of all the fourth pair is called [X] *Lumbares*, the Loins-veins [4 4 4] two, or three, which the Hollow-vein sends forth from its backside, which looks towards the bodies of the Rack-bones of the Loins; and therefore they are not to be seen, unless the Trunk of the Hollow-vein be lifted up. These veins go in through the holes of the Rack-bones, through which the Nerves go out, and so carry nourishment to the Spinal marrow. From them two other veins, tyed on both sides to the side of the Marrow, ascend toward the brain, with which afterward two veins descending from the internall Jugular, are joined by an *Anastomosis* or Inoculation.

These propagations being thus sent out, when the Hollow-vein has almost attained to the *Sacrum*, or Holy-bone, about the fifth Rack-bone of the Loins, it inclines under the great Artery, and is cut into two notable branches called *Iliaci* [XX] which having gone a little way are again cleft into two others [Y and Z] of unequal bignesse, of which one is called the inner, the other the outer. The inner is lesse, the outer larger and greater. But before they be so divided, they scatter two other propagations, the first of which [5] is commonly called *Muscula superior*, the upper Muscle-vein, which is disseminated overthwart, through the Muscles of the Loins, and *Abdomen*, or paunch, from whence I would call it *Muscula lumbalis*, the Muscle-vein of the Loins: the other [6] is named *Sacra*, or the Holy-vein, because it reaches some little twigs to the upper holes of the Holy-bone, for the nourishing of the said bone and the Spinal-Marrow.

But from both the Iliacall branches many veins issue, before they go out of the *Peritoneum* or Rim of the Belly toward the Legs; and from the inner branch two. The first [7] arises from the outside called *Muscula media*, the middle Muscle-vein; because it is scattered into all the Muscles of the Buttocks, and into their skin: For it carries aliment to all those Muscles, which are of the outside, or Back of the bone *Ilium* or Hanch-bone, as also to the very joint of the Hip, that for this cause it ought to be especially taken notice of by them, who would somewhat curiously consider the cause of the ach in the Hip, or the *Sciatica*. I should think that this vein may not be amiss called *Glutæa* from its insertion, because it is implanted into the Muscles called *Glutæi*, or Muscles of the Buttocks. The other [8] grows out of the inside, and is a notable vein, called *Hypogastrica*, or the vein of the water-course, from its distribution into almost all the parts of the *Hypogastrium*, or water-course. From this issues a branch named *Hæmorrhoidalis externa*, the outer Emroid-vein, because if at any time it swells with a more feculent blood, or hot, or salt, it makes the outward Emroids of the Fundament. This affords twigs to the holes of the *Os sacrum*, or Holy-bone, but bestows greater branches upon the Muscles of the *Rectum Intestinum*, or the Strait-Gut, as far as to the outer skin of the Fundament. There is also another branch arising from the same *Hypogastrick-vein*, which we call *Cysticus*, the Bladder-branch, and is worthy of observation both in men, and women; in men, because it is spent upon the Bladder; but in women, because in them being sustained with a fat membrane, it goes with some twigs to the Bladder; but with more to the bottom of the Womb; and with more manifest ones to the Neck of it, by which veins alone some think that the monthly courses flow in Virgins, and some also think the same in women. But the monthly courses do not only flow out by these branches, but by those also, which we told you were sent from the spermaticall branch, and which go to the bottom of the Womb, not to the Neck. For the menstruous blood is usually purged out, whether in virgins, or women, every month; not only through the Neck, but especially through those passages of the Womb, called *Cotyledones*. Which we have shown here at *Padua*, publicly in the Theater, the first year of our being Professor, in the carcase of a certain woman having her monthly courses. For we saw that the *Hypogastrick* branches, and the spermatick vessels with the Testicles were filled with blood, and that the Womb itself did pour out a thicker blood, the little mouths of the veins in the inner part of the Womb lying open, and manifestly gaping. Yet I saw twice in others, that the menstruous blood came out of the veins of the Neck only, not also out of the Womb, and in another on the contrary that it flowed out of the Womb only. But the ordinary way is for women to be purged at them both, and not at one only, except when besides the intent of nature obstructions do seem to hinder their flowing.

But we have observed, and seen divers times, whilst we were about the cure of Ulcers in the privie Members, and Neck of the Womb, that at what time the monthly courses do flow, the mouth of the Womb gapes. I saw also then, that those parts were dilated with a certain stinking moisture, and that the Neck of the Womb appeared much larger, then it was wont to be at other times. And therefore no man need to wonder at that, which hath been observed by some Writers of our age, that in the time of their courses these parts have been so widened in some, that being new married, although they were true Virgins, they have for this reason been accused, and thought to have been deflowered. Wherefore if it happen, that any, who are new married, doubt of their Wives virginity, because they find the privy passage very wide, it will behove them to consider, whether their flowres were not at that time upon them. Now at length the remainder of the inner Iliacall Trunk makes to the Share bone, and taking to it a propagation of the outer Iliacall, together with which it makes one vein, and so passing through the *Peritoneum*, and hole of the Share-bone, it spreads itself into the Leg, and is extended almost beyond the middle of the Thigh on the inside.

Propagations
of the outer
Iliacall branch.
Epigastrica.

From the outer branch in like manner some veins issue: and first of all, that which is called *Epigastrica*, or vein of the lower Belly [9] which arises from the higher part of the branch, and is so named, because it goes to the Muscles of the *Epigastrum*, to wit, the right Muscles of the *Abdomen*. For passing with its chief branch out of the *Peritoneum* or Rim of the Belly, it climbs straight up of both sides under the right Muscle, till it come near to the Navill, where it is joined by *Anastomosis* with the descending Mammary-veins. But this *Anastomosis* or Inoculation is seldom found in men, but in women it is very conspicuous, from whence also *Galen Lib. de Dissect. ven. & Arter. Cap. 8.* witnesses, that that great sympathy betwixt the Womb and the Breasts or Dugs is caused by these two vessels. But the most learned *Hippocrates* has explained this sympathy in many Aphorisms of the fifth Section. For in the fiftieth Aphorism he says, If you would stop the courses in a woman, apply a very great Cupping-glasse to her Breasts. And in the thirty seventh. If the Breasts of a great bellied woman, do of a sodain become small, the child proves Abortive. And in the thirty eight; If one of the Breasts of a great bellied woman become small, one of the Twins, that she goes with, proves Abortive; and that a Male, if the right Breast be small; a Female, if the left: so the Womb being diseased, the Nipples become pale; and upon a Dropsie in the Womb they swell up. But there is a sympathy also not only by reason of the veins, but also of the Nerves, that come from the sixth Conjugation. Whence we see, that if the Breasts of a Woman, or Virgin be handled, they are provoked to lust; so that for this reason also those women, that have great Breasts may be accounted more lustfull, as *Afra* is in *Martiall*. But it is convenient to note concerning the originall of this vein, that very often it arises out of the Cru-rall branch, which we shall by and by describe, but oftner out of the Iliacall. Another vein is the *Pudenda* [11] which arises from the inside of the outer Iliacall branch, after it is come out of the *Peritoneum*, or Rim of the Belly, and it is called *Pudenda*, because it is spent upon the privities of both Sexes. For in men it is distributed into the *Scrotum* or Cod, and into the skin of the Yard; but in women it is propagated to the Lips and skin of the privy passage, to the *Nympha* or wings, and other parts of it; but in both men and women to the Glandules, that lye about the leskes, whence arises that conflux of matter into these Glandules, in a pestilent or venereous *Bubo*. Lastly, the *Muscula inferior*, or lower Muscle-vein [12] is that, which goes to the joint of the Hip, and is disseminated into the skin, and Muscles thereabout, by reason whereof in my judgment by a stricter Appellation it might be better called *Coxendica*, or *Coxalis*, the Hip-vein.

Pudenda.

*Muscula infe-
rior*.

CHAP. V.

Reckons up the propagations, and branches of the outer Iliacall branch disseminated through the crus, or great Foot, that reaches from the lower part of the Buttocks to the ends of the Toes.



The division of
the Cru-rall vein
into a Trunk
and branches.
Four propaga-
tions of the
Trunk before
its division.
Saphena.

He outer branch then of the Iliacall veins [Z] when it hath sent forth the said propagations, falls out of the Rim of the belly, and is carried to the *Inguina* or leskes, through the upper and inner region of the Hip-bone, through which the first and second bending Muscles of the Thigh do descend, and makes the Cru-rall vein [T]. The History whereof that we may deliver in an easie method, we will divide it into Trunk, and Branches. But before the Trunk be cleft into its branches, it shoots out four propagations; the first of which is that they call *Saphena*, [13] and vein of the inner Ankle, because it runs near thereunto; it is also commonly called by Physicians *vena tali*, but improperly, as we have said above in our first Book. But it arises from the inner side of the Trunk, presently after its departure out of the *Peritoneum*, or rim of the Belly, and having no Artery for its companion, runs straight downwards under the skin

skin, through the insides of the Thigh, & Leg; and when it is now come to the inner Ankle, it spreads itself into the upper part of the Foot, and scatters a branch overthwart, from which afterward many others arise, that are distributed in their order to every one of the Toes. This vein scatters other propagations by the way, but which are seldom found answerable one to another, either in number, or bignesse; as we have already more then once intimated, that nature is found to sport in the veins, but especially in those of the joints. The first [17] of these propagations, not far from the originall of the vein itself, is delt into the upper skin of the inner Region of the Thigh, in two branches; of which the outer, which is the thicker, creeps through the fore, and outside of the Thigh, under the skin; but the inner goes more inwardly, and spreads itself into the rim of the Belly. The second [18] is propagated, when the vein has now attained to the middle of the Thigh. The third propagation [19] arises about the Knee, and brings forth two off-springs, one, which is disseminated into the skin of the forepart of the Knee, by the *Patella* or Whirlbone, but the other into the skin of the Backside, where the bending, or Ham is, about which it is rowled or circularly. The fourth [20] is carried to the middle of the *Tibia* or Leg, with furcles forward, and backward. Over against the *Saphena*, another vein [14] is brought forth from the outside of the Trunk, but shorter then the vein *Saphena* is, and reaches outward, and overthwart into the skin, that covers the forepart of the Hip-bone, as also into the Muscles of the same place, which the later Anatomists call *Ischia*. These propagations being brought forth, the Trunk afterwards is drencht into the Muscles, that compass the bone of the Thigh, and sets out a third propagation [15] which they call *Muscula* the Muscle-vein; and there use to be two of them. For the outer, which is the lesse, sends shoots to the second, and fourth, extending Muscles of the *Tibia* or Leg, together with the skin; the inner, and greater, affords twigs to the third extender of the Leg, and to almost all the Muscles about the Thigh. After this the Trunk turning to the Backside, and descending by degrees, scatters some other twigs into the membranes of the Muscles, and by and by sends out a fourth vein, which runs into the backside of the Thigh, and is called *Poplitea*, the Ham-vein [16] much spoken of by writers of Physick, but especially by *Hippocrates* the chief of them, who 6. *Epidem.* 1. 5. commends much the opening of it in diseases in the Kidneys. But it is oftentimes seated too deep to be cut without very great difficulty. I have learnt by frequent experience, that issues made in the *Sura* or calf of the Leg, to which this vein spreads itself, have done a great deal of good in many diseases. This vein, when it is propagated, sometimes receives the addition of a Sprig from the inner branch of the Muscle-vein; oftentimes also two propagations issue from the Trunk, one higher, and another lower, which afterward are united in their journey. But presently after its rise it scatters some branches into the skin of the Thigh, about the higher and hinder part of it; then it runs down directly through the middle of the Ham, or bending of the Leg, into the Calf, to which it distributes many Surcles, that run on with an uncertain course, some directly, some overthwart, and some obliquely. These little branches being thus disseminated, the vein passes on as far as to the *Talus*, or Cockall-bone, and there at length determines.

And this is the progresse of the Crurall-Trunk, and these the propagations which it scatters, before it be divided. For lying upon the bone of the Thigh, it so descends, and runs side-long near to it, that, when it has attained to the Knee, it is carried betwixt the two lowest, and hindmost heads of the Thigh, in which place [A] it is cleft asunder into two branches, an outer, and an inner one. But they are of unequall bignesse, the outer being the smaller, and the inner the greater, but both of them [B A] are scattered through the Leg, and lowest part of the Foot. The inner [B] in its descent sends some propagations to the Muscles, that are placed on the backside of the Leg, and especially those which make the Calf, but most of all to the inner part [21] of the *Gasteronemius externus*, or outward Calf-Muscle, and so afterward continuing its course downward, when it is come to the lower *Appendix* of the *Tibia* or Leg, and has bestowed some shoots upon the skin, it is reflected under the inner Ankle [22] and runs out as far as to the great Toe. The outer [A] is presently cleft into two lesser branches, that are likewise unequal, of which the inner [E] that is the greater, and lies deep, is wholly spent upon the Muscles of the Calf, running all along directly betwixt the two heads of the *Gasteronemius externus*, or first moving Muscle of the Foot, as also betwixt the *Gasteronemius internus*, or inward Calf-Muscle, and the *Tibius anticus* or forward Leg-Muscle, and at last betwixt the Muscles, that bend the Toes, distributing some furcles every where by the way to the Muscles, through which it passes. When it comes to the mid length of the Leg, it is again subdivided into an inner, and an outer branch. The inner of these distributes a twig near to the joint of the *Tibia* or greater Leg-bone, and the bone called the Cockall, descends with the Tendons of the Muscles, and is divided into the great, the fore, and the middle Toes. The outer passes on near to the *Fibula*, or lesser bone of the Leg, and when it comes to the Ligament, which ties together the greater and lesser bones of the Leg, it shoots forth a branch, which perforating the Ligament runs into the Foot, and is scattered into the Muscles; which bend the Toes of the Foot outward.

Four propagations of the vein *Saphena*.

Ischia.

Muscula.

Poplitea.

The division of the Trunk into two branches.

But

But the outer and lesse branch [11] of the Crurall-vein goes from that division of the outer branch, which is made near the Ham, to the upper *Appendix* of the *Fibula*, as also to the outer, and hinder part of the *Tibia*, where scattering many little branches, it goes to the outer Ankle, and at last ends in the Foot.

And this is the universall History of the Hollow and Gate-veins, wherein we have perfected the whole course of their distributions. It seems yet to remain, that we speak of the Umbilicall, and Arterious veins. But because the Umbilicall vein is nothing else but a more notable propagation issuing out of the Gate-vein; and in a man grown performs the office of a Ligament, rather then a vein; because it keeps the Liver in its place; as the stories of them do witnesse, who upon the cutting off, or wounding of the Navill, have sodainly dyed, their respiration being hindred by the weight of the Liver falling out of its place, and putting down the *Diaphragma* or Midriffe with it; we thought it not worth our pains to make any more mention of it in this place. But if any one will obstinately contend that it is a peculiar vein with arguments fetcht out of his own Brain, we know no better counsell, that we can give him, then to consult better with his own sense, or if he will contend further, to purge his Head with Hellebore, that that dimnesse of his Eye-sight may be a little taken away. But we shall with more convenience make mention of the *Vena Arteriosa*, or Arteriall-vein, in the following Book, when we shall explain the History of the *Arteria venosa*, or venall Artery, because they are very like one another, and therefore the same pains may serve them both.



Ren

An Explanation of the Table of the Veins.

This Table delineates the Hollow-vein, entire, and free from all parts. Wherein we have marked the Trunks, and larger branches, with pretty great letters: but the propagations with little ones; and when they are at an end, with figures.

AD.



The Ascendent Trunk of the Hollow vein, the beginning whereof is about A, which notes the place, wherein the Liver should stand in the proportion of this figure, the end about D. For it passes on undivided from the convex part of the Liver, about which it scatters little branches, a a a. as far as to the Hollow of the Neck; but it scatters some propagations, three in number. The first of these, æ æ, is called vena Phrenica the vein of the Midriff, which is distributed of both sides into the midriff and Pericardium, or purse of the Heart growing thereto, as also into the Mediastinum or partition of the Chest.

aa a.

æ æ.

bb.

cc.

ddd.

B.

C.

D.

EE.

e.

ff.

g.

h.

i.

l.

m.

Another is Vena Coronaria the Crown-vein, bb, which embraces the basis of the heart in manner of a Crown, dispersing many Surcles to the point of it. The third is the vein Azygos, or without a mate, cc, which issuing out from the right side of the Hollow-vein, about the heart, about the fifth Rack-bone of the Chest, goes down near to the right side of the Rack-bones, as far as to the second almost of the loines. There are ten propagations d d d from this, sent to as many bony distances of the ribs, which are called Inter-costales inferiores, the lower veins between the ribs.

Shews how the Trunk AD is bowed toward the right side, because of the situation of the heart.

The orifice of the Hollow-vein reaching into the right ventricle of the heart.

The division of the Ascendent Trunk about the Hollow of the Neck, into two branches EE. which they call Subclavia, or the veins under the Collar-bones. From these arise many propagations, some issuing from the lower, others from the upper part of them.

Out of the lower part issue five. The first is called Intercostalis superior the upper vein between the ribs, e, and scatters two Surcles f f, to the distances of the three upper ribs: The second is mamma-ria the vein of the dugs, g, which, descending under the breast-bone, as far as to the strait Muscles of the Abdomen, is inoculated i o, with the Epigastrick-vein climbing upward, 9, giving surcles to the Gristly distances of the true ribs, as also to the Mediastinum, and Muscles, that lie upon the breast. The third called Mediastina, h, is disseminated into the Mediastinum, or partition of the Chest. The fourth, verte-bralis, or the vein of the Rack-bones, i, climbs up through the holes, that are bored in the transverse processes of the Rack-bones of the Neck, distributing sprigs to the Muscles, that lie upon the Rack-bones. The fifth is called Cervicalis or the vein of the binder part of the Neck, l, distributed into the Muscles, seated on the lower part of the back side of the neck, and on the upper part of the Chest. Out of the upper part issue three. The first is Jugularis interna, the inner vein of the Hollow of the Neck, m, which having sent ever small sprigs from its outer branch to the Chest,

n.

o o.

p.

q.

r.

f.

t.

u.

x.

y.

a.

β.

1.

2.

3.

F.

γ.

δ.

ε.

ζ.

G.

η.

H.

ι.

κ.

λ.

μ.

ν.

and region of the Ear, is joined by the inner all the way to the Arteria carotis, or sleepy Artery, and is divided near to the skull into two branches called Encephalici or of the Brain, by Spigelius; of which the hindmost and greater, n, having entred into the skull through the second hole of the Nowl bone, is inserted o o, into the first 1, and second 2 sinus of the thick membrane. But the foremost and lesser, p, having entred through the seventh hole of the wedg-bone, is scattered through the sides of the thick membrane. The second is the outer Jugular vein, q, which getting up by the sides of the Neck, is divided near to the Ears, r, into two branches; of which the one called Profundus, f, is variously disseminated into the Muscles of the Larinx or Throttle, and the bone called hyoides, as also into the Tongue, the Palat, and hollownesse of the Nostrils, and lastly into the skull with three propagations, of which that which passes t out of the forepart of the eye, through the second hole of the wedg-bone, is very well delineated here. The other called Subcutaneus, u, first of all spreads its fore-branch x, into the Muscles and skin of the Face, which joins with its fellow about the top of the nose, and makes the Forehead vein y; then it issues out another hinder branch, which partly, creeps upward along the temples, z, and partly is carried behind the ears to the skin of the back part of the head. a. The third, Cervicalis Superior, the upper vein of the Neck, β, is propagated into the Muscles behind on the back side of the Neck. There are three sinus or small channels of the thick membrane of the brain, the first or right one is marked with 1, the second or left one with 2, the third with 3. The hinder part of this, which is nearer to the Nowl of the Head, is shadowed; but the forepart, which is next the Forehead, is seen manifestly. From this sinus many little veins, which they call Ductus, are reacht forth to both sides.

Here the subclavian vein takes on it the name of Axillaris or the vein of the Armpit, and is divided into two branches, the Cephalick G, and the Basilick I. But before this division it scatters two twigs: the first called scapularis interna, or the inner vein of the shoulder blade, γ, the other Scapularis externa, the outer blade vein δ. The Basilick vein also, I, before it enters the Arm, propagates two; one called Thoracica superior, the upper Chest-vein, ε, which is distributed through the inside of the Pectorall Muscle, and in women, through the Dugs: the other called Thoracica inferior, the lower Chest-vein, ζ, which descending along the side of the Chest, goes to the Muscle called Aniscliptor.

The Cephalick vein, which, before its division, sends away a sprig, η, into the Muscle deltoides, and another θ into the Muscles of the Cubit.

When the Cephalick vein comes to the joint of the Cubit, at the outer bunching forth of the Arm it is cut into three branches, H. The first, ι, or deep and middle one goes to the Muscles arising from the said protuberation. The second κ, or inner goes to the making of the vein called Mediana λ. The third μ, or outer is carried obliquely, by the radius or lesser bone of the Cubit, to the out side of the Arm, and so creeping on obliquely all the way, when it is come to the root of the wrist, it is joined with a little branch of the Ba-

D d d d

slick

slick-vein, τ , and makes the vein called Salvatella.

The Basilick-vein, which on the right hand is called Hepatica, or of the Liver, on the left Lienaris, of the Spleen. This before its division sends out a Surcle, σ , to the heads of the Muscles of the Cubit; and then another notable one π , which being carried down obliquely, bestows its Surcles upon the Muscles, that arise from the outer protuberation of the Arm.

The division of the Basilick-vein K into two branches, the one called Profundus or the deep one, the other Subcutaneus, or branch under the skin. The deep one L, when it comes to the bending of the cubit, is divided into two, M, one of which called Radius N, at the Radius, or lesser bone of the Cubit; the other called cubiteus, O, at the greater bone of the Cubit, goes to the hand.

Subcutaneus, or the branch next under the skin P, near to the inner protuberation of the Arm is divided, Q, into two other, of which the inner R together with the inner branch of the Cephalick π , makes up the vein mediana λ , which is likewise divided into two branches, the outer of which, ρ , is called by some Cephalica manus, and goes to the Thumb; the inner σ to the fore and middle fingers: The outer S going to the wrist, is joined toward the little finger with the outer branch of the Cephalick-vein about τ .

The little valves, which are found in the veins of the joints, are handsomely cut out here, as it were to be seen through.

The Descendent Trunk of the Hollow-vein which begins about the region of the Liver T, and ends about the fifth Rack-bone of the loins V. There are four Twigs growing from this. The first ν called Adiposa or Fattie-vein, distributed to the Membrane of the Kidneys. The second ϕ the Emulgent going to the Kidney. The third, preparans ϖ , the preparing vessel; the right one χ arising out of the Trunk T.V. the left ψ out of the left Emulgent, both afterward going into the Testicles ω . The fourth is the three Lumbarcs or loin-veins 444.

The division of the Descendent Trunk V, into the two Iliacall branches XX, both which are again divided into two other, an inner one Y, and an outer Z. But before this division two propagations are issued forth, Muscula lumbalis, or the Muscle-vein of the loins 5,

and Sacra or the holy-vein 6.

The inner Iliacall vein, before it goes out of the Peritoneum, or rim of the belly, shoots out two propagations, the first called Glutaca 7, and the second Hypogastrica 8. The remainder of it passing through the Peritoneum, is spent upon the inside of the Thigh.

The outer Iliacall vein likewise before its going forth of the Peritoneum scatters three propagations; the first called Epigastrica 9, going into the Muscles of the Epigastrium, and the strait ones of the Abdomen, where they are joined by Anastomosis, or inoculation 10. The second called Pudenda, 11, spent upon the privy parts. The third Coxalis, 12, upon the Muscles of the Hip.

Here the outer Iliacall vein having past through the Peritoneum or rim of the Belly enters the Crus, and begins to be called the Crurall Trunk Γ , that is undivided as far as to the two lower heads of the Thigh. But it reaches forth four propagations before its division.

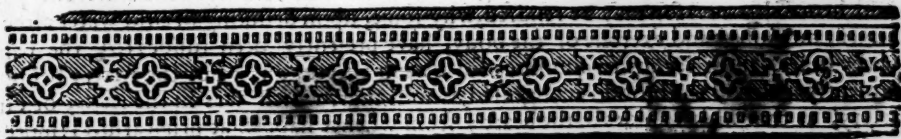
The first; 13, is called Saphena, which creeps through the inside of the Leg, under the skin as far as to the ends of the Toes. Another 14 called Ischia is spread out into the skin upon the Hip-bone. The third 15 named Muscula is sent to the Muscles, which extend the Leg. The fourth 16 named Poplitea is distributed into the Calf of the Leg.

The vein Saphena also scatters from itself four surcles, the first 17 into the upper part of the skin of the inside of the Thigh: the second 18 about the middle of the Thigh: the third 19 into the Knee: the fourth 20 is carried forward and backward to the middle of the Leg.

The division of the Crurall Trunk near to the two lower heads of the Thigh into an inner branch Θ and an outer one Λ .

The inner distributes little branches to the Muscles of the Calf 21, and then runs down under the inner ankle to the great Toe 22.

The outer presently is cleft into two branches, an inner one Ξ , and an outer Π . That is spent wholly upon the Muscles of the Calf: this passes on near to the Fibula or lesser bone of the Leg, through the outer and back-side of the Leg.



The second Treatise, Concerning The A R T E R I E S.

CHAP. I.

Shews the upper or ascendent Trunk of the great Artery, with its propagations that are distributed through the Head.



Here is no controversie among writers of Anatomy concerning the number and originall of the Arteries, but an unanimous consent, that all the propagations, which are scattered throughout the body, take their rise from one, which they call *Aorta*, and that this is derived out of the Heart. But the Heart consisting of two *sinus* or cavities, a right, and a left one; this great Artery grows out of the left *sinus* or ventricle [A], where it is largest, and more hard, and gristly, then elsewhere. But as soon as it is grown out, and before it fall out of the *Pericardium* or purse of the Heart, it presently propagates two small sprigs [a a] one of each side, which they call *Arterie Coronarie*, the Crown-Arteries, because together with the *vena Coronalis*, or Crown-vein, they compass the *basis* of the Heart in manner of a Crown, and from these many propagations are scattered downward all along the Heart. But they are more, and greater about the left, then the right ventricle, as we have also formerly said concerning the vein, because the Heart needs a greater plenty of blood on that side, as which beats with a perpetuall, and more violent motion, wherein more blood is digested, then the right *sinus* or ventricle does: yet that propagation is bigger, and longer, which arises out of the right side of the Artery: sometimes also there is only one, at whose orifice a little valve is found. These propagations being thus disseminated, the Artery ascends somewhat, under the Trunk of the *vena Arteriosa*, or Arteriall-vein, and pierces through the *Pericardium*, and, having got above it, is cleft [B] into two branches, which because of their notable greatnesse we will call Trunks, and because one ascends [C] and the other runs downward [Q] that shall be the Ascendent Trunk, this the Descendent. Yet the Descendent, and lower one is bigger by much then the upper, because that serves more parts, then this. For the Ascendent one goes only to some parts of the Chest, to the Head, and Arms; but the lower to very many parts of the Chest, to all the lowest Belly, and the Legs. That therefore we may treat of the great Artery with more perspicuity, we will first shew the Ascendent Trunk, and its progress through the Chest, and Head, and after that its branches distributed through the Arms. Then we will fall upon the Descendent one, and explain the manner of its distribution through the Chest, and lowest belly, and lastly through the Legs.

The Ascendent therefore or upper Trunk of the *Aorta* [C], being fastened to the *Oesophagus*, or Gullet, climbs upward betwixt the rough Artery, and Hollow-vein, and the *mediastinum*, or partition of the Chest. Which situation of it they ought diligently to observe, who desire to know the reason of that Aphorism, which is the four and twentieth of the fifth Section in *Hippocrates*: For, sayes he, cold things, as snow, and ice, are enemies to the Breast, provoke coughs, and cause eruptions of blood, and distillations. Truly they are enemies to the Breast, because, whilst they are swallowed down through the Gullet, they cool the rough Artery, that lies next to it, together with the Gullet, which part being of it self cold does easily take harm from so violent a cold: hence the cough, and other diseases of the Breast follow one another in a long row. But issues of blood happen in like manner, the great Artery being cooled, whereby the vitall Spirits, and the blood are driven back to the Heart, and from thence are sent up forcibly to the Head, which being stuf, eruptions of blood are caused by its dropping forth at the Nostrils, as

The originall of the great Artery.

Arterie Coronarie the Crown-Arteries.

The divisions of the great Artery into two Trunks.

VVhat parts both the Trunks nourish.

The order of that which is to be said.

also catarrhs and distillations, it being driven down undigested to the inferiour parts. And hence also a reason may be rendered, why some, upon drinking of cold water after vehement motions, and exercise of the body, have presently been suffocated, the passion of the heart, and grievous swoondings following thereupon. For the Artery being vehemently cooled, the blood is congealed, as well that, which was in the *Aorta*, or Great artery, as that which abides in the heart; from whence happen at first fearfull symptoms, and then suddain death. But we have seen in these men, that a vein being opened, the blood hath come out thick, and cold, and with very great difficulty, whence also we have not found a more present remedy for them, then such things, as by reason of the thinness of their parts have a power of dissolving the clots of blood. Hence also a reason may be given, why in burning fevers the tongue becomes black, and the diseased can hardly swallow. For although it be true, (which is the cause commonly assign'd) that many vapors are sent up from the whole body to the head; yet we may ascribe a main cause of this blacknesse to the nearnesse of the artery, which being set on fire, and inflamed, procures much mischief to the gullet, and consequently to the tongue itself.

The division of the Ascendent trunk into two branches. The subclavian arteries.

Intercostalis superior, the upper artery between the ribs.

Vertebralis, the artery of the rack-bones.

Mammaria, the artery of the paps.

Cervicalis, the artery of the neck.

Arteria axillaris. Its branches before it enters into the arm. From its lower part.

From its upper part one.

But the Ascendent Trunk, whilst it passes thus upwards, is divided into the two subclavian arteries, [DD] of which one runs to the right side, and the other to the left. They are called *subclaviae*, as long as they are in the chest, for the same reason as the subclavian veins are so called, because they run under the *claviculae* or collar-bones: but as soon as ever they are fallen out of the chest, they change their name, and are called *Axillares* [E]. From both the subclavian arteries, when they have attained to the first rib (for before that they send forth no propagations) many sprigs issue out, as well from their upper, as lower part. From the lower issues the upper Intercostal artery, or *Intercostalis superior* [b], which being fastned to the roots of the ribs, bestowes particular branches upon the distances of the four uppermost which run under the ribs, together with the veins, as far as to the gristles, from which propagations are dispersed into the marrow of the back, and the neighbouring muscles. From the upper part issues first that which is commonly called *Cervicalis*, or the artery of the neck [c], but better *vertebralis*, of the rack-bones, which arises more backward, and toward the bodies of the rack-bones, and ascending obliquely, near to the seventh rack-bone of the neck, like the neck-vein, passes through the holes of the transverse processes, and upper rack-bones of the neck, where it shoots out many propagations, which enter the spinall marrow through the common holes, at which the nerves go out. It sends also a pretty company to the muscles that are seated on the backside of the neck, and ascends to the nowle-bone together with the vein, through whose first notable hole, by which the spinall marrow descends out of the head, it enters the skull. After this it is joined with its fellow of the other side under the spinall marrow, which remains yet in the skull, and so runs straight forwards, under the middle of the *basis* of the brain; but when it hath now attain'd to the *sella*, or saddle of the wedg-bone, upon which the phlegmatick glandule lies, it is divided into two branches, a right, and a left one, both which at the side of the saddle creep to the second pair of the nerves, where being broken on both sides into an infinite number of furcles, they are dispersed betwixt the first and second pair of the nerves, and folded together with the thin membrane make that complication of vessels call'd *plexus Choroides*. The next is *arteria mammaria*, or artery of the paps [d] which being reflected under the breast-bone (accompanied with the mammary vein) descends along its sides, and when it comes to the gristle call'd *Ensi-formis*, or the breast-blade, about the sides thereof goes out of the chest, and running under the right muscles of the abdomen, descends directly through the lower side of them, and at length near the navell, is joined by *anastomosis* or inoculation [x] with the Epigastrick artery plying upward [i]. But before it leaves the chest, it scatters particular branches to the six distances betwixt the gristles of the seven true ribs, which branches determin together with the gristles. A third [e] is otherwise called *Muscula* the muscle artery, but might bee better, and more strictly named *Cervicalis*, being it is disseminated into the muscles, that are placed in the region of the neck, as far as to the *occipitium* or nowl of the head.

These branches being sent out, the subclavian artery goes out of the cavity of the chest, and getting above the first ribs tends obliquely to the arm-pit, and so makes the axillary artery [E] which afterward is spread into the arm. But before that it scatters some propagations, and from its lower part three, of which the first is *scapularis interna*, the inner-blade artery [f] which goes to the muscles on the hollow side of the shoulder-blade. Another is *Thoracica superior* the upper chest artery [g], which goes to the pectorall muscle, that leads the shoulder forward to the breast, and the other muscles that lie upon the breast, and is a pretty big one. The third is *Thoracica inferior* the lower artery of the chest, [h] which is also a large one, and running down all along the side of the chest, is the greatest part of it scattered into the broad muscle called *Latissimus*, which moves the shoulder backward from the breast. From the upper part of the axillary artery arises one called *scapularis externa* the outer blade-artery [i], which climbing up to the top of the shoulder is disseminated into the muscles that cover the gibbous side of the shoulder-blade,

blade. The remaining part of the axillary artery passes on in company of the Basilick vein to the arm, upon all which it is afterward spent, of whose distribution we will speak in the following Chapter.

That which remains yet of the Ascendent Trunk [L] being sustained with the *Thymus* neer to the upper part of the breast-bone, is divided into two branches [MM] which they call *Carotides*, or *soporales* the sleepy arteries, because they being obstructed, or any way stoppt, we presently fall asleep, of which *Valuerda* witnesses in *Anatom. lib. 6. c. 11.* that *Realdis Columbus* made tryall in a young man, among a great company of men. They are unequall in bignesse, the right one being much thicker then the left, but they tend directly upward, being carried along by the sides of the neck, and fastned to the rough artery, and to the internall jugular veins, by the benefit of a membrane, and when they are come to the cups, are divided into two branches [N] of which one is the outer, the other the inner one: that is the lesse, this is the greater. The outer [O] sends propagations [†] to the cheeks and muscles of the face; when it is come to the ear, it is divided in twain; for one branch [r] of it goes to the backside of the ear, from which two branches under the ear enter the neather jaw through the first hole of it, that is seated at its processes, and throughout the length thereof are disseminated into the roots of all the lower teeth; that which remains, going out at the second hole, which is placed at the chin, is scattered into the lip. The other branch [q] creeps through the Temples and fore-head, and is spent upon the muscles of the face. The inner branch [P] of the sleepy artery, or *arteria Encephalica* the brain-artery, is carried into the chops; and having scattered some propagations to the tongue and throttle, is divided about the basis of the skull, into two unequall branches, to wit, a greater, and a lesser one. The lesser and hindmost [s] is carried together with the greater Encephalick branch of the internall jugular vein to the back-side of the skull, enters through the second hole of the *occipitium* or nowl-bone, and goes into the *sinus* or canale of the thick membrane. The greater and more forward [t] having entred the cavity of the skull through a hole made on purpose for it in the temple-bone, and attain'd to the saddle of the wedg-bone, going every where under the hard membrane; first of all propagates a branch on both sides into the side of the thick membrane, then in beasts scattering an infinite number of furcles makes the *Rete mirabile* or wonderfull net, which indeed may be found in a man too, but it is very little, and seems but a shadow in respect of that in beasts. These furcles being thus placed it pierces through the thick membrane of the brain, and having got out of it, sends another propagation out of the skull, through the second hole of the wedg-bone to the eye, and its muscles, as also to the temple muscle, that lifts up the lower jaw; and then going straight up to the side of the phlegmatick glandule, it is divided into two branches, an outer, and an inner. The inner is joined with its fellow of the other side, and being joined they are wasted into many little arteries, which are disperfed through the thin membrane, and the very substance of the brain, to the originall of the optick nerves. The outer being reflected and sustained with the thin membrane, goes into the forward ventricle of the brain; being divided into many furcles, which are united with those little arteries, which arise from the *vertebralis*, or artery of the rack-bones; some with those which the *vertebrall* artery scatters through the basis of the head under the brain, but others with those which it disseminates through the thin membrane and substance of the brain, together with which they make the *plexus choroides*.

The sleepy arteries.

The division of them.
The outer, or branch of the face.

The inner, or branch of the brain.

The division thereof into a lesser and greater branch.

A subdivision of the greater.

CHAP. II.

Declares the History of the Axillary artery being distributed through the Arm.

THE Axillary artery therefore when it is come to the arm, taking the name of the Arm-trunk [I] is carried in one undivided stock, beyond the bent of the cubit, through the inside of the arm, dispersing some small propagations on both sides to the muscles that lie on the inside of the upper part of the arm. But it goes fast by the inner or deep branch of the Basilick vein, as an unseparable companion of it, whose conduct and steps it every where follows. But presently falling down by the back-side of the upper part of the arme, where the muscles which extend the cubit stick to it, it sends forth two propagations [l & m] the lower of which is a very notable one, and so it is writhed back toward the bent of the cubit, and having attained thereunto it reaches out two furcles [n n] one of each side, so manifest, that the pulse is there oftentimes evidently enough perceived. Then going under the bent of the cubit, through the inside of it, and sinking down betwixt the two muscles that bend the second and third bones of the four fingers, it is cut [G] into two notable branches, one of which is an outer, the other an inner one. The outer [H] is carried along

Brachialis trunks, the trunk of the arm.

The division thereof into two branches.
The outer

along

The inner
branch,

along the *Radius*, or lesser bone of the cubit (whence I call it *Radicus*) and goes directly to the wrist, in which place Physicians feel the pulse, it being very manifest, by reason that the artery lies next under the skin. But not far from the root of the wrist it shoots out a little branch [o] which runs under the tendons of the muscles, which extend the thumb, into the outside of the hand, and is spent upon the muscles, which are placed betwixt the first bone of the thumb, and that of the after-wrist, which supports the fore-finger. This branch being propagated, going under the inner annular ligament of the wrist, and the broad tendon of the palm-muscle, it is divided into three branches [ppp] like the vein, and nerve, that are its companions. The first of these goes to the inside of the thumb, the second to the inside of the fore-finger, and the third to that of the middle. The first, and second are each of them parted into two branches; the third is undivided. The inner branch of the trunk of the arm [I] runs straight along the *ulna* or greater bone of the cubit (and for that reason I call it *Cubitus*) and is dispersed into the palm of the hand. But it is so hidden among the muscles, that it is hardly perceived to beat, unlesse in lean folkes; and therefore Physicians alwaies lay their hands upon the outer branch, when they feel the pulse in the wrist. But it passes on under the transverse ligament of the wrist, and the tendon of the palm-muscle, in company of a vein, and nerve, and scatters two branches into the little finger, as many into the ring-finger, and one into the outside of the middle.

CHAP. III.

Shewes the Inferiour or Descendent Trunk of the great artery, and the propagation thereof through the middle and lowest bellies.



EE have said above, that the great artery [A] as soon as it has gotten above the *Pericardium* or purse of the heart, is divided [B] into two branches; of which one goes upward, the other descends to the parts below. We have already handled the upper branch; it remains that wee explain the other also.

The Descen-
dent trunk.
Its progress.

The Descendent trunk therefore [Q] answering in proportion to the stock of a tree, is carried down to the fifth rack-bone of the chest, and declining somewhat to the left, cleaves to that side of the body of the rack-bones, and so descends leisurely. When it has now past the midriff through that division resembling a semi-circle, which is betwixt the productions of the *septum transversum* or midriff, presently it runs out by the rack-bones of the loins, leaning upon the middle of their body, till it come to the last of them, where near to the *os sacrum* it is divided [R] into two notable branches [SS] which with other Anatomists we will call *Iliaci* the Iliacal arteries from their situation. In this journey it scatters many propagations from it self, which are very worthy to be diligently observed, because from thence we may easily give a reason of many accidents in diseases. But they are in number eight, the Intercostal arteries, the two *Phrenice* or arteries of the midriff, the *Cœliacall* one, then the upper *Mesenterick*, the two *Emulgents*, as many *spermatick* ones, at last the lower *Mesenterick*, and the *Lumbares*, or arteries of the loins. Of these the Intercostals are scattered, whilst the trunk is yet in the chest; the rest, whilst it passes on through the lowest belly. But some of them accompany the branches of the gate-vein, as the *Cœliacall*, and both the *Mesenterickall* arteries; others those of the hollow vein, as the rest. Now we will treat of these in order, beginning from the Intercostals, or arteries between the ribs, which are placed uppermost. Presently therefore after the Descendent trunk [Q] is issued forth, from its back-side it sends over little branches on both sides to the distances of the eight lower ribs, which they call *Intercostales inferiores*, the lower arteries between the ribs [u u u] in respect of the upper Intercostal, of which we have spoke above. These associating themselves with the veins and nerves of the same name, go straight on by the lower side of the ribs, where peculiar *sinus* or channells are cut out for them. But as the Intercostal veins reach in the true ribs only to the gristles, but in the bastard ones somewhat farther, to wit, to the sides of the *abdomen*: so also the arteries end in them together with the bony part of the ribs, but in these run out a little farther. And these arteries send over some propagations through the holes of the nerves to the spinall marrow, and to the muscles that lie upon the rack-bones of the back, just as we have said the Intercostal veins were propagated. But the use of them is to diffuse the vitall spirit, and the blood to the muscles betwixt the ribs, besides which they have also another notable office, to wit, of carrying down the water, and purulent matter, that is gathered together in the chest, into the great artery, and from thence by the *Emulgent* branches to the bladder. Although I am not ignorant that the most learned *Fallopian*, and others who have read before me in this most famous University of *Padua*, have shewn another way to their Auditors, by which either purulent matter, or water might be conveyed forth by help of the kidneys, to wit, the vein *sem pari*, or without a companion, a little branch whereof in the left

Its propagati-
ons.

Intercostales in-
feriores, the ar-
teries between
the lower ribs.

Their use.

left

est side goes into the Emulgent of the left kidney. But this way which we shew through the Intercoastal arteries, is by much the shorter; that I pass by this, that any matter heaped together may be more easily dispatcht away through the arteries then the veins. Nor needs any one here to be afraid, lest the vital spirits should be infected from these excrementitious and ill humors, whereby the heart may incurre fearfull symptomes; when we willingly grant (which experience also hath often taught us) that whilst the corrupt matter is emptied out by the urine, the sick parties have often fallen into fits of swoounding, and other diseases; sometimes also have died suddenly, when the peccant humor has been of too great a quantity, or too bad a quality, and has offered so much violence to nature, that the heat, and spirits have been overcome therewith. But here a certain place in Hippocrates calls upon me to explain it, which has long and often troubled my mind. The place is in *Cocis prenotionibus*, where he says; They, who together with the heart have their whole lungs inflamed, so that it falls to the side, are deprived of motion all over; and the parties so diseased lie cold, senselesse, and die the second or third day. But if this happen to the lungs without the heart, they live not so long. Yet some also are preserved. I have often thought with my self, what should be that sympathy of the heart and lungs with the brain and nerves, that from the inflammation of those parts, the Patient should be so deprived of sense and motion all over, when the same Hippocrates teacheth in the same place, that the diseased suffer such deprivation in that part, & livid spots appear on the outside about the rib, where-about the *Aorta* (so he seems to call the lobes or divisions of the lungs) being inflamed fall to the side. But if they be not much inflamed, so that they fall not down to the side; he sayes that there is a pain indeed all over, but no deprivation of sense or motion, nor any spots appear. Having deliberated often with my self, at length I came to be of this opinion; that there was no other cause, but the sympathy betwixt these Intercoastal arteries, and the marrow in the back-bone. This sympathy arises from those propagations, which we told you pass through the holes of the rack-bones of the chest into the backbone. Wherefore if the lungs, and heart be so mightily inflamed, that great plenty of blood rush into the great artery, whereupon it swells, as also these vessels betwixt the ribs, and consequently those surcles which go to the marrow of the back-bone; truly it cannot be, but that both the marrow, and the nerves, which issue out of it, be compressed, from whence what else can follow, but the resolutions of those parts, into which those nerves are implanted, and to which they impart the faculty of motion? This opinion seems to mee to be wonderfully confirmed by a certain pretty observation, which the learned *Cornelius Gemma* has in his book, *de hemittiræo pestilenti*. A certain studious young man, sayes he, through the whole course of his disease, had his left eye lesse then the other. He was pain'd in the left side, especially all the time the fit raged; but about the crisis or change thereof, the artery of his left leg being swollen up was moved according to its length, that being to be seen by us it seemed to be turned upward and downward like a rope pull'd back. Who will not here willingly confesse, that this matter was in the arteries, when the crisis was made by them? But from this that hath been said a reason may be also given of another observation of *Galen*, which is 4. *de locis affect. c. 4.* where he sayes thus: In a certain man, who was troubled with a vehement inflammation of the lungs, as well the outer, as the inner parts of his arm, from the cubit to the very ends of his fingers labour'd with difficulty of sense, and their motion also was somewhat empair'd. In the same man also the nerves, which are in the first, and second distances betwixt the ribs, sustained harm. And a little after, This man was quickly restor'd to his health, to wit, a medicine being applied to the place, from whence the nerves issue forth, near to the first, and second spaces betwixt the ribs. By reason of the same branches betwixt the ribs *John Valeriola*, the son of that Physician, whose observations we have, being yet a boy suffered Convulsion-fits in a grievous Pleurisie.

The explanation of a place in Hippocrates.

The arteries called *Phrenica* of the midriffe, [x x] are two; one of each side, which arising out of the trunk, presently after it is come forth of the hollow of the chest, being divided into more branches, are scattered into the midriffe, but especially into the lower side of it, near to the rack-bones of the back. They sprinkle some small twigs also into the upper part, which afterwards go to the *Pericardium* or purse of the heart, there where it growes to the midriffe.

2.
Phrenica the arteries of the midriffe.

The *Caliaca* or Stomach-Artery is but one, so called, because it sends over branches to the *nomia*, that is, the Stomach. This, being most like to the spleenick branch of the Gate-vein, affords many branches to the Stomach, Liver, Bladder of Gall, Kell, the gut *Duodenum*, the beginning of the *Jejunum* or empty Gut, a part of the *Colon* or Colique-Gut, the Sweet-bread, and Spleen. But it arises out of the fore-side of the body of the Trunk, and being stayed up all the way by the upper part of the lower membrane of the Kall, is divided into two notable branches, but of unequall bignesse, one of which goes to the right, the other to the left: that is the lesse, this the greater. The right branch therefore is joined with the descendent Gate-vein in the *Pancreas* or Sweet-bread, that is placed under the hinder part of the Stomach, and leaning there upon the membranes of the Kall goes to the Liver; and its smalnesse is worth the taking notice of, if you look upon the largeness of the Liver, which the Ancients long since, and many at this day have made the work-

3.
Caliaca.

The two branches thereof. The right branch.

house of the blood. But it is inserted in the hollow part, near to the Trunk of the Gate-vein, and is so small, because that part of the Liver, which entertains the roots of the Gate-vein, needed not a greater Artery; but the other part which hath the propagations of the Hollow-vein, receives great plenty of vitall spirit sent over from the Heart through the Hollow-vein. Yet before it enters into the Liver, it disseminates in the way many furcles, and those partly from its upper side, partly from its lower: *from the upper side* two, first, that which I call *Pyloricus*, which arises in the mid-way, and being divided into many little branches is scattered into the back-side of the right orifice of the Stomach. The other is called *Cystica gemella*, the Twin-Arteries of the bladder of Gall, which are two little branches, and go into the bladder of Gall, and presently are divided into many propagations. *From the lower side* likewise two arise. The first is *Epiplois dextra* or the right Kall-Artery, which is implanted into the right side of the lower membrane of the Kall, and part of the Colique-Gut annexed thereunto. The other is cleft into two branches, of which one called *Intestinalis*, the Gut-Artery passes on to the *Duodenum*, and beginning of the *Jejunum* or empty Gut: the other, named *Gastro-epiplois dextra* the right Stomach and Kall-Artery, somewhat larger then the former, turns down to right side of the bottome of the Stomach, and being supported by the upper membrane of the Kall, issues out some shoots from the upper part to the fore and back-sides of the Stomach; but from the lower to that membrane of the Kall, upon which it leans. The left and greater branch is called *Arteria Splenica* the Spleen Artery, which sticking to the lower membrane of the Kall, and the Glandules placed therein, passes on together with the Spleen-vein, to which it is fastened, and in like manner distributes its propagations to the Spleen. But in the way likewise it distributes branches from both parts of it: *from the upper* issues *Gastrica* the Stomach-Artery, which reaches into the middle of the hinder part of the Stomach, or that, wherewith it leans upon the back, and ascending from thence it compasses the left orifice of the Stomach round about like a crown, and disperses little twigs, partly upward to the end of the Gullet, partly downward, and those greater, and more numerous, into the Stomach, and so it makes the *Arteria Coronaria* or Crown-Artery, like to the Crown-vein, which arises from the Gate-vein, as we have said in the fore-going Treatise. But *from its lower side* the Spleen-Artery sends out the *Epiplois sinistra*, or left Kall-Artery, about that part, wherewith it now attains to the Spleen, which runs out into the left side of the membrane of the lower part of the Kall. This Artery presently after its rise is cleft into two branches, which part very far asunder from each other, from which many other Arteries arise, that are all consumed upon the said membrane of the Kall, and the Colique gut, that is tyed thereto. These branches being issued, the Spleen-Artery draws nearer to the Spleen, and just like the vein of the same name, which accompanies it all the way, is cleft into two branches like the Letter Y, one of which may be called the upper, the other the lower, which afterward entering by the hollow part of the Spleen are splintered into an infinite number of little sprigs, so that there are five times more Arteries there, then veins. Whence it comes to passe, that in inflammations of the Spleen, if you lay your hand to the left *Hypochondrium*, or place under the Gristles of the Bastard-ribs, it seems to pant. But before this entry of the Artery of the lower branch makes a notable *anastomosis* or inoculation with the lower branch of the vein, and propagates a twig to the lower membrane of the Kall. But from the upper branch issues one called *Gastro-epiplois sinistra*, the left Stomach and Kall-Artery, which being fastened to the upper membrane of the Kall is derived into the left side of the bottome of the Stomach, bestowing little branches upon the fore and back-sides of it, or also upon the upper part of the Kall. Another issuing from the upper branch makes the *vas breve Arteriosum*, or short Arteriall vessell, carried, like the vein its name-sake, to the left side, and orifice of the Stomach.

The use of the right branch, which goes to the liver, besides the common one, which it hath, is this, as often as the bladder of Gall is obstructed, to carry down choler to the Guts, and especially to the Colon, into which some of its branches are implanted. Which is the reason, that in bloody Fluxes the Ulcers are almost alwayes found in the great Guts, and especially in the Colon, very seldom in the small ones. For this artery, when either the Liver being over hot breeds abundance of choler, or the bladder of Gall is obstructed, receiving into itself store of choler carries it directly over to the Colon, or Colique Gut. In like manner the use of the left branch, or Spleen Artery, besides the common one, is to throw down choler, melancholy and wheay humors, if at any time the Spleen abound with them, to the Guts. Moreover by this same way the waterish humors in such as have the Dropsie, are sometimes committed either to the Guts, or to the Kidneys and Bladder. This same branch is that by which the drink passes so sodainly through the whole body, and by which ill humors are cast out by vomit. This same is the cause, that upon a full Stomach we make little water; but more when the concoction therein is finished. For the Stomach being much distended presses it; but that once empty, it can perform its office. This same branch teaches us that a slender diet is to be prescribed to them, who are to take purges, that the way may be open for the medicens, as well that, by which

Propagations
from its upper
part.

1.

From its lower
part.

1.

2.

The left branch

Propagations
from its upper
part.

From its lower
part.

Its division.

The use of the
right branch.

VVhy ulcers
are more fre-
quent in the
great guts.

The use of the
left.

the excrements are sent over to the Stomach, as that, by which they are conveyed to the Guts. This same branch also, if you adde the two Mesentericks, is the seat of the hypochondriacall Melancholy. For this disease arising from the obstruction of the entrails, which are contained in the lowest belly, it is necessary that the arteries here should suffer very much, which the very Symptomes, that happen in this disease, may sufficiently inform us.

Mesenterica superior, the upper Artery of the Mesentery [*y*] arises a little below the Cœliacall, being distributed like the Meseraick vein (which is its companion) with numerous propagations into the Guts called *Ilium* and *Jejunum*, as also that region of the Colon, which reaches from the Hollow of the Liver as far as the right Kidney, and so for the most part into the upper part of the Mesentery. In which place it is to be observed, that the Artery sometimes lies upon the vein, sometimes on the contrary the vein upon the Artery, and so is carried betwixt both the Membranes of the Mesentery. But these Arteries in many places in the Mesentery have Glandules, which were made for the free perspiration of the vessels, and especially of the Arteries, whereby it comes to passe, that these Glandules labouring with a hard tumor, or *Scirrhus*, the vessels are compressed, and a pining away of the whole body follows thereupon.

4.
Mesenterica superior.

An observation.

The Emulgent arteries [*z*] are two, one the right, another the left one. Both issue out under the forementioned Artery, where the first, and second Rack-bones of the loins are coupled together by the Ligament. But they arise out of either side of the Trunk, although not directly over against one another, as also it is in the Emulgent veins, the right one being lower then the left. These Arteries, when they come to the Kidney, are cleft into two branches, with which they are inserted into the *sinus* or channels of the cavity of the Kidneys, and like the veins are consumed in an infinite number of little sprigs upon their substance. Their use, besides the common one, is to purge out the whey, which is found in great plenty in the Arteries.

5.
Emulgentes.

Their use.

The spermaticall, or seed-arteries [*a*] are likewise two, which arise out of the forepart of the Trunk of the great Artery, their originals touching each other; for the left Artery issues not from the Emulgent, as the left spermaticall vein does. Afterward in their descent they are made fast to the veins of their own side, and in men are carried through the processes of the *Peritoneum* or Rim of the Belly to the Testicles; but in women, when they come somewhat near to the Testicles, they are divided into two parts, one of which is carried to the Testicles, the other to the bottom of the womb. But the arteries do so come to the womb, that they only water it at the sides, and pierce not at all into the inner parts of it. Which truly came to passe by the great providence of wisest nature, since it had not been so safe to have brought them down to the inner surface of the womb, by reason that in the coming forth of the child very great issuings of blood would be caused to the no small danger of the woman in Child-bed, if the Arteries had been annexed to the Womb on the inside. Hence also it is, that in the time of delivery they flow by little and little, not rushing down with violence.

6.
Spermaticæ.

Mesenterica inferior, the lower Artery of the Mesentery [*β*], arises near to the *Os sacrum*, or great bone, a little above the division of the Trunk into the Iliacall branches, and goes into the left side of the Colon, and into the strait gut, descending with the hæmorrhoidall veins to the very end of the Fundament, and making the hæmorrhoidall Arteries. It is questioned concerning the use of both the Mesentericks, whether besides the common, they have any peculiar one. For *Galen* in his 4. of the use of the parts, seems to make mention of some other when he would have some part of the *chylus* to be attracted by them. And in the book, whether blood be contained in the Arteries, in the fifth Chapter, he says: If we divide the lowest belly, and the inner membrane, we shall plainly see the Arteries in the Mesentery filled with milk in Kids newly yeaned, but in living creatures that are grown, full of something else. In which words Anatomical experience teaches us, that not onely the Meseraick veins, but Arteries also do manifestly draw the *chylus* to them. Which being so indeed, it is altogether to be believed, that the *chylus* is either afterward transported by them into the veins, or else turned into blood by the Arteries themselves. Nor will this seem wonderful to any one who shall consider also that the mothers blood is conveyed through the Umbilical Arteries to the child, whilst it is yet shut up in the Womb. But if the blood which is received by the veins ought yet to be better worked, as any diligent inquirer into nature will conclude it ought; truly that which is received by the Arteries will require to be so much the more exactly laboured, by how much the better it is, then that of the veins. But it is so laboured in the Arteries themselves, and in the Spleen, being haled into the Cœliacall Artery, and carried to the Spleen. And this is an excellent use of the Mesenterick Arteries, whilst a man enjoys perfect health, besides which we will adde another also, as often as he leaves to be in health. For these Arteries take to them the excrements of the whole body, that they may carry them down to the Guts, in like manner as the veins do, by which nature doth both attract the *chylus*, and likewise expell the noisome humors out of the body, as choler, phlegm, and melancholy. Choler is thus expelled oftentimes in continuall and intermitting cholerick fevers, a solution whereof follows by a looseness. Phlegm is so

7.
Mesenterica inferior.

Its use.

An observati-
on.

V Why anoin-
ting of the na-
vell with such
things as purge,
loosen the
belly.
How the colick
is changed into
the gout; and on
the contrary.

8.
Lumbares.

How the colick
disease ends in
a palsie or Epi-
leptic.

expell'd, as often as bloody fluxes happen to such as have the gout in the feet, which ease them of their pain, if the intent of nature be advanced by the help of a wise Physician. Last-ly melancholy is conveyed out by both the Mesentericks, but especially by the hæmorrhoi-dall branch; whence *Hippocrates* sayes, 6. *Epidem.* He which has the Emroids naturally, shall neither be troubled with the pain of the side, or inflammation of the lungs, nor with fel-lons or black pustles, called *Terminibz*, nor with the Leprosy, canker, or other diseases. For there is a very great sympathy betwixt the breast and the hæmorrhoidall artery, becau'the trunk, out of which it arise, descending from the heart, presently after it first issues from thence, propagates the Intercoastall branches. Moreover all black cholerick humours are purg'd by this means out of the whole body, that cankers, and leprosy cannot be caused by them. From these voluntary purgings which nature it self has found out, wee may now judg of such as are caused by the help of a Physician, and may be termed Artificiall. For an opinion of some men hath prevailed much in our age, that the body cannot be purged by clysters, but only by those medicins, which are taken at the mouth. But I will not only believe, but also being taught it by experience can witnesse, that, if the clysters contain in them purging medicins, the whole body is very commodiously cleansed. For the whole colick gut receiving the matter of the clyster, the vertue itself of the medicin draws down the noisome humors by the Arteries out of the *Aorta* or great artery. Which being granted, we may give a reason (what we have seen very often) why Suppositories made of white hellebore produce the same symptoms, as are wont to be caused in them, who have taken in white hellebore at the mouth. In like manner from hence we may fetch the reason, why the belly is strongly purged, the region about the navell, being anointed with purging medicins. For the vertue of the medicin is attracted by the arteries, and by them afterward it purges. These arteries are they, by which the disease of the colick is changed into the gout, and on the contrary the gout into the colick, as we have it in *Hippocrates*, 6. *Epidem. Sect. 4.* where he sayes: One, that was vexed with the pain of the colick on the right side, had some ease, whilst the gout held him; but this disease being cured, he was pained more. The reason hereof was this, because that humor, which caused the gout, was carried out of the joints to the colick gut, whereby the colick disease was increased. *Laurentius*, inquiring into the cause of this, refers us to hidden and unknown passages, to which, it seems to me, that we need not fly, if we say, that the humors are brought out of the crurall arteries into the trunk, and out of this into the Mesenterick branches, and lastly, out of these into the guts; for this is the shortest, and most convenient way. Nor is there any reason, that we should be a fraid of that pollution of the vitall spirits, which they will object to us if the excrementitious humors passe through the arteries; for this betrays their great ignorance as well in Anatomy, as in solid physics, and it would be very easie, if I would digresse, to prove in this place, that a great part of the humors in our body flow down through the arteries. For in them the strength of nature exceeds, and is more vigorous, that whensoever it is pro-voked, it is most apt to expell; and the blood being stirred by their continuall beating, as also by its own nature, makes all that is therein more fit to flow. And who will not be-leeve that excrements are carried through the arteries, who considers the flowings down from the spleen, in which there being five times more arteries, then there are veins, truly it is necessary that that ballast of the spleen be carried out through the arteries?

The four *Lumbares* or loin-arteries [γγγ] arise out of the backside of the trunk of the great artery, all along as it passes through the region of the loins. They run through the common holes into the rack-bones of the loins, and to their marrow, and also into the neighbouring muscles. And at the side of the marrow, after they have entred the rackbones, they climb upon both sides to the brain together with the veins of the loins. But they are alle-qually big, if you except those two, which issue out near to the *os sacrum* or holy-bone, which are not only derived into the rack-bones to the marrow, and to the muscles therea-bout, but are also sent overthwart through the *peritonæum*, and muscles of the *Abdomen*. The two last are by some called *Musculæ superiores* the upper muscle-arteries, and are distinguish'd from the *Lumbares*. And these are the arteries, which if we observe, we shall easily give the reasons of many things, of which Physicians do still dispute very hotly; but especially of that most difficult question, which is controverted among Physicians, by what wayes, and in what manner the colick ends in a palsie or in the falling sicknesse. For we have the observation in *Paulus Ægineta lib. 3. c. 43.* where he sayes: the colick, as it were by a cer-tain pestilent contagion, ended with many in the falling sicknesse, with others in a resoluti-on of the joints or palsie, their sense remaining; and they who fell into the falling sick-nesse, for the most part dyed, but they who fell into the palsie, were most of them pre-served; the cause of the disease being carried to another place in the solution. For the humor, that caused the disease, came back out of the colick gut through the mesentericall ar-teries, from whence being afterward transported into the trunk of the great artery, it came also to the *Lumbares* or arteries of the loins, which swelling with blood prest together the neighbouring nerves, from which came the palsie in the feet. And this we have often observed, as well in our selves, as in others, especially in former years, when these dis-eases

eases at Padua were Epidemiall. Yet the Palsie is not alwayes a perfect one, but often (as I am wont to call it) imperfect, because the power to walk is not wholly taken away, but the diseased stand upon their feet with a great deal of difficulty. Many at that time being deceived in the knowledge of the disease, mistaking this for a great weaknesse of body contracted by their sicknesse, endeavoured to take it away by eating and drinking largely, but in vain. This also is the cause, why the Falling-sicknesse, and Lethargies too, as we have oft-times seen, follow after the Colick, because the matter being sent over from the Mesenterick arteries to those of the loins, may easily go from them into the brain, to which those very vessels are carried.

But the trunk of the great artery, when it is come to the last rack-bone of the loins, having taken its journey all the way, which we have shewed, under the hollow vein, at the left side, here gets above the vein, lest it should be worn away in that continuall motion by the hardness of the holy-bone. But it is divided, no otherwise then the hollow vein is, into two notable branches [S. S.] which are called by Anatomists the Iliacall arteries. From their situation, and being carried downward obliquely to the thigh resemble the γ of the Greeks turned upside down. But they also just like the Iliacall veins, to which they are exactly answering, before they be implanted into the thigh, shoot out a pretty number of branches. But from the lower side of the artery before the Iliacall branches be divided, issue forth *saera* *Sacra*. the holy arteries [A] which are notable ones, and carried downward, leaning upon the holy-bone, passe through the β thereof, and run to the marrow and backside of the bone. And through those also there is a way for the matter, that makes the Colick, to cause the Palsie of the legs.

After this a little below the division of the trunk, the Iliacall arteries are subdivided into two branches, one of which is the inner and less; the other outer and greater. The *lesse and inner* [T] issues out two propagations, one from its outside, the other from its inside. The *outer* [s] is commonly called *Aduscula*, by us more strictly *Glutaa* the muscle of the buttocks, because it runs down with its name-like vein, betwixt the holy and hip bones, where they part one from another, and scatters many twigs into the muscles, which lye upon the *Os Ilium*, or hanch-bone, called *Glutai*, or the muscles of the buttocks; because they are the authors of them.

The division of the Iliacall arteries into an inner and outer branch. Propagations of the inner or lesse branch.

1.

Glutaa.

2.

Hypogastrica.

The inner is called *Hypogastrica* [C] which is very notable, and large, and, being carried directly down to the lower side of the holy-bone, it affords certain propagations in men to the bottome, and neck of the bladder, as also to the strait gut, which also may be called the Hemorrhoidall arteries; but in women, to whom this branch is somewhat larger, it distributes a great number of propagations, besides those to the fore-named parts, into the lower region also of the bottome of the womb, and likewise into its neck. Hence we may gather the reason, why, if the womb reach to the middle of the hip, Convulsions are caused, as Hippocrates witnesseth, *leg. de natura muliebri*. As also if the womb fall down to the hip, why the monthly flowers are suppress'd, and a pain is caused in the softness of the sides, and in the lowest belly. For the blood which nature drives to the wombe, cannot be laid in there, the arteries being prest together by the falling down of it, so that necessarily flowing back, it fills the neighbouring veins and arteries, which swelling up cause these pains. For wee have oft-times seen in dissections these veins so swollen, that they have been seven fold bigger then themselves. Hence also a reason may be given of the thirty second Aphorism of the fifth section in the same Hippocrates, where he witnesseth, that a woman vomiting blood is rid of her disease, upon the issuing forth of her tearms. Which happening by the consent of all by revulsion or attraction of the humour to a contrary part, and that not by the benefit of the veins, because the veins of the stomach arise out of the gate-vein, but they of the wombe from the Hollow one; there is no other sympathy to be sought for, then that which is caused by the arteries, especially when the Hypogastrick or artery of the lower part of the lowest belly is not far distant from the Coeliacall, or artery of the stomach. Hence likewise a reason will be given of the Aphorism that follows this, wherein he judgeth the *Hæmorrhagia* or abundant issuing forth of blood at the nostrills to be profitable when the monthly courses do fail. The remaining part of the lesser Iliacall artery descends, and brings forth the Umbilicall or navell artery [nn], which is carried down near to the length of the great artery, and is tyed with strong membranes to the sides of the bladder of urine. But it loses its hollownesse in those that are once out of the wombe. After this [o] like the Iliacall vein which is joined to it, it goes through the hole of the share bone, or *os pubis*, which before it be past, it takes to it a propagation issued from the outer Iliacal branch, and so goes out of the hole, and being departed from it spends it self, in like manner as the inner Iliacall vein does, upon the muscles; partly those with which the hole is stoppt; and partly those which arise from the share bone. At length being terminated at the middle almost of the length of the thigh, the end of it meets [o], and is united with the ends of the branches [v] of the inner muscle-artery of the leg, of which we shall speak in the next Chapter.

Arteria umbilicall.

Propagations of the outer or greater Iliacall branch.

1.

Epigastrica, or the artery of the upper part of the muscle the lowest belly.

The greater or outer Iliacall artery [V] produces likewise two propagations, the first of which [i] is called *Epigastrica*, which arising from the outside of it, a little before it passes through the peritonæum or rim of the belly is reflected upward, and ascends by the inside of the strait

Pudenda or the
artery of the
Privy parts.

muscle til about the navel it be inoculated with the descendent Mammary artery. The other [A] is called *Pudenda*, which is a little inner propagation, being not divided into so many branches, as the vein of that name is. But it arises presently after the artery is gone out of the *peritoneum*, and being carried overthwart along the commissure or joyning together of the share-bones, is spent at the privy parts upon the skin of the yard. That which remains of this trunk goes into the *crus* [X], whereof we shall now speak.

CHAP. IV.

The propagations of the outer Iliacall branch, which are distributed through the Crus or great foot, containing the thigh, leg, and foot.



The trunk of
the crural ar-
tery and its pro-
pagations ere
it bee divided.

- After that the outer branch [V] has propagated the fore-mentioned branches, it departs out of the *peritoneum* or rim of the belly, and at the groin is carried into the *crus*, by the same way which the crural vein takes, under which it goes, and is joined in company therewith every where, and so it makes the trunk of the Crural arterie [X], (as we will alwaies call it). But presently after it hath got beyond the *peritoneum*, it issues forth a propagation from the outside, which is called *Muscula cruralis exterior*, the outer muscle-artery of the *Crus*, which being carried downward is propagated into the muscles that cover the forefide of the bone of the thigh. Sometimes over against this, but oftner a little below, yet of the inside another is brought forth, called *Muscula cruralis interna*, the inner muscle-artery of the *Crus*, [v] which is distributed in many branches through the third bending muscle of the thigh, called *Triceps*, and those on the inside of the thigh, as far as the knee; the ends of which branches are joined with the end of the inner Iliacall artery, which we told you descends through the hole of the share-bones to the *Crus*. These propagations being dispatcht away, the crural trunk descends from the groin, together with the crural vein; and is so bent backward near to the bone of the thigh, that when it is come to the ham, it stands betwixt the two hindmost heads of the thigh. For prudent nature does alwaies observe this, to carry down the vessells about that side of the joint where the bending is, lest if they should go on that side whereon the joint is extended, they should be compressd. But in the very mid-way as it were, as it runs down through the thigh, it sends out a propagation [π] which breaking into more surcles runs out through the muscles that are seated on the backside of the thigh, together with the ham-vein; and at length descending through the ham (whence it is called *Poplitea* the ham-artery) is distributed with many sprigs into the calf of the leg. But whilst it stayer in the ham, it sends out a propagation [ρ] on each side, to the sides of the joint of the knee, which then sinking deeper, are consumed partly in the joint it self, partly upon the muscles called *gasteromenii* that make the calf; from whence they are called *Surales*, the arteries of the calf.
- 1.
 - 2.
 - 3.
 - 4.

After that the Crural trunk lyes in the ham [Y], it sends forth a propagation from its outside [σ] which runs down near to the *Fibula* or lesser bone of the leg, and is hid betwixt the muscle, that moves the foot outward, and the second bending muscle of the instep, and distributes it self into the rest, that lye on the forepart of the leg, as far as they are fleshy, and till they begin to be contorted by the outer ankle. A little under this same another artery [τ] is brought forth out of the backside of the trunk, which runs down as far to the mixing together of the tendons of the calf-muscles. Then another [υ] issues out of the same backside of the trunk, but under the second, which descending and passing through the transverse ligament, runs down by the top of the foot, and is diffused into the muscles that move the toes outward. The remainder [r] of the trunk is carried downward by the backside of the leg, and about the inner ankle offers a surcle [φ] to the foot, which goes to the muscle of the great toe, and creeps through the top of the foot. But the trunk it self lying hid among the tendons of the muscles of the toes is cut [χ] into two branches; of which the Inner [ψ] bestowes two surcles upon the great toe; two upon the fore toe, and one upon the middle; the outer [ω] two upon the little toe, and two upon the toes next to it, on the lower side. But although the progresse of the arteries be for the most part such, as we have described, yet what we have said formerly of the veins, that their distribution varies much, not only according to the diversity of bodies, but also of sides in the body of the same man, is true also of the arteries, which in divers men are diversly distributed.

An Explanation of the Table of the Arteries.

This Table comprises the delineation of the great Artery, entire and free from all the parts.

A



He large beginning of the great artery, where it issues out of the left ventricle of the heart: but presently after its rise, and before it yet falls out of the peri-

cardium or purse of the heart, it shoots forth the two Coronary arteries, a, a, which encompass the basis of the heart in manner of a crown.

a a

B

But presently having past the pericardium it is divided B into two trunks; one of which is the Ascendent C, the other the Descendent one Q.

C

DD

The Ascendent trunk C, is by and by divided into the two subclavian arteries DD, both which when they have attained to the first rib, scatter many propagations; partly from the higher, partly from their lower side.

From the lower side issues Inter-costalis superior, the upper artery between the ribs, communicating particular twigs to the distances of the four upper ribs.

b

From the higher side issue three. The first is vertebralis, the artery of the rack-bones, c, creeping on by the transverse processes of the rack-bones of the neck, as far as to the skull.

c

d

The second mammaria the artery of the dugs, d, which descending under the breast-bone, runs out as far as to the seat of the navill, and distributes sprigs into the distances of the gristles of the true ribs, and then into the muscles that lye upon the breast; at length about the navill it joins by anastomosis or in-culation, x, with the ascending Epigastrick artery, 1. The third cervicallis or the artery of the back side of the neck, e, is propagated to the muscles on the back side of the neck, as far as the nowl of the head.

e

These branches being issued out, the subclavian artery goes to the arm-pit, and takes the name of axillaris, about E, and so is diffused into the arm. Yet before it enters thereinto, it shoots out some twigs from both parts of it: from the lower three; of which the first,

E

f

f, is called scapularis interna the inner blade artery, because it is spent upon the muscles that cover the hollow side of the shoulder-blade. The second is Thoracica superior the upper chest artery, g, dispersed into the muscles on the fore side of the chest. The third

g

h

h, Thoracica inferior the lower artery of the chest, which descending along the sides of the chest, is inserted into the muscle called Anisclaptor, that moves the upper part of the arm backward. Betwixt g and h a little branch is placed, one of them which here are disseminated into the glandules of the arm-pit. From the upper part issues one, i, called scapularis externa the outer blade artery, being disposed of into the muscles, on the outside of the shoulder-blade.

i

FF

In this place the axillary artery changes its name, and is called Brachialis the trunk of the arm, that is undivided as far as G, scattering two twigs l and m into the muscles that cover the bone of the upper part of the arm on the back side, and two other n n, one of each side about the bending of the cubit.

l m

n n

G

The parting in twain of the Brachial artery under the bought of the cubit into an outer H, and inner branch I.

H

The outer branch of this division, or Radius, running straight along the radius or lesser bone of the cubit to the wrist, and distributing a branch o into the muscles seated betwixt the first bone of the thumb, and that of the metacarpium or after-wrist, which sustains the fore-finger, and then three other, p p p, which are dispersed into the first outer fingers, the thumb, and wit, the two fingers next therunto.

o

PPP

I

The inner branch, or Cubitus passing along the greater bone of the cubit, is at length consumed in a double branch upon the two inner fingers; to ring-finger and little one.

L

MM

The remaining part of the Ascendent trunk, which near to the upper part of the breast-bone is cleft into two branches MM called Carotides, or the sleepy arteries. These tend directly upward by the sides of the neck, and being come to the chops are divided into two branches about N, one of which is the outer O, the other the inner P.

N

O+

The outer Carotis propagates twigs + to the Buccæ or cheek puffs; and to the muscles of the face; but about the ear it is cut into two branches, a foremost one, q, which is carried through the Temples; and a hinder one, r, that is disseminated along the back side of the ear under the skin.

q

r

P

The Inner Carotis, going to the skull is divided near to the basis thereof into two branches; of which the one and lesser, s, which goes into the sinus on the side of the thick membrane, is cut off here, whereabout it sinks into the

s

t the skull: the other and greater, t, enters the skull, through a peculiar hole bored for it in the temple-bone.

Q The Descendent trunk of the great artery, reaching downward to the rack-bones of the back.

From this before its division at R, many propagations are scattered, which we will now rehearse in order.

First then are Intercostales inferiores, the lower arteries between the ribs, u u u, distributed to the distances of the eight lower ribs, from which propagations are brought to the marrow of the back-bone; and to the muscles that grow to the back and chest. After this the trunk passing on distributes two more, called Phrenicæ the arteries of the midriff x x, because they are disposed of into the midriff. Then follows Cœliaca or the stomach. After that Mesenterica superior, the upper artery of the Mesentery, y, reaching out into the guts Jejunum, and Ileum, as also into that part of the Colon, which reaches from the hollow of the liver as far as the right kidney. After this the Emulgent arteries, z, propagated to the kidneys. Then spermaticæ, the seed arteries, going to the testicles, under which is Mesenterica inferior or the lower artery of the Mesentery, ß, departing into the left side of the colick, and into the strait gut, and making the hemorrhoidall arteries. Lastly Lumbares the arteries of the loins, γ γ γ, which going to the rack-bones o, the loins joint by joint, are distributed, into the peritonæum or rim of the belly, and the muscles growing to the rack-bones.

R These branches being issued forth, the trunk about the fift rack-bone of the loins, is divided into two branches SS called the Iliacall, both which are again broken into two other, an inner branch T, and an outer one V. But before this division in the very parting in twain of the Trunk, arises sacra the holy artery d, distributed into the holes of the os sacrum or holy bone, to the marrow thereof.

T The inner Iliacall artery, before it falls out of the peritonæum, issues forth two propagations: from its outer side, that called glutæa, a, distributed into the muscles of the buttocks; from its inner side, that called Hypogastrica, ζ, going into the bladder and yads, and in women also to the bottome of the womb. After this it runs down, and sends forth the umbilicall arteries η η, that tend upward near to the length of the great artery.

θ The remainder under θ, taking to it a propagation from the outer Iliacal artery, slips down through the hole of the share-bone into the Crus, the end of it joining about a with the inner muscle artery of the Crus γ.

V The outer Iliacall artery likewise before its going forth of the peritonæum produces two. The first is called Epigastrica, ι, digested into the muscles of the Epigastrium, and the straight ones of the abdomen, where it is joined by inoculation κ, with the descending mammary artery d. The other called Pudenda λ, goes to the privy parts.

X In this place the outer Iliacall artery having past the Peritonæum, enters the Crus, and begins to be called the Crural trunk, which issues out more propagations. The first is Muscula cruralis exterior, the outer muscle artery of the Crus, μ, that is propagated into the muscles, that cover the fore side of the Thigh-bone. The second is the inner muscle-artery of the Crus, ν, digested through the third bending muscle of the thigh; and those muscles that are on the inside of the thigh; the end of it are joined with the ends of the inner Iliacal artery about o.

π The third is Poplitea, the ham-artery, π, running out into the muscles on the back-side of the thigh. The fourth is suralis the calf-artery ρ ρ, which is double, issuing out there, where the crural trunk is hid betwixt the two lower heads of the thigh, and spreading out on both sides into the joint of the knee, and the two heads of the first extending muscle of the foot.

Y Here the great artery lies in the ham, where it is divided into branches of unequall bignesse.

σ A sprig issuing from its outside, and reacht out to the fibula or lesser bone of the leg, betwixt the muscle that moves the foot outward, and the second bending one of the instep.

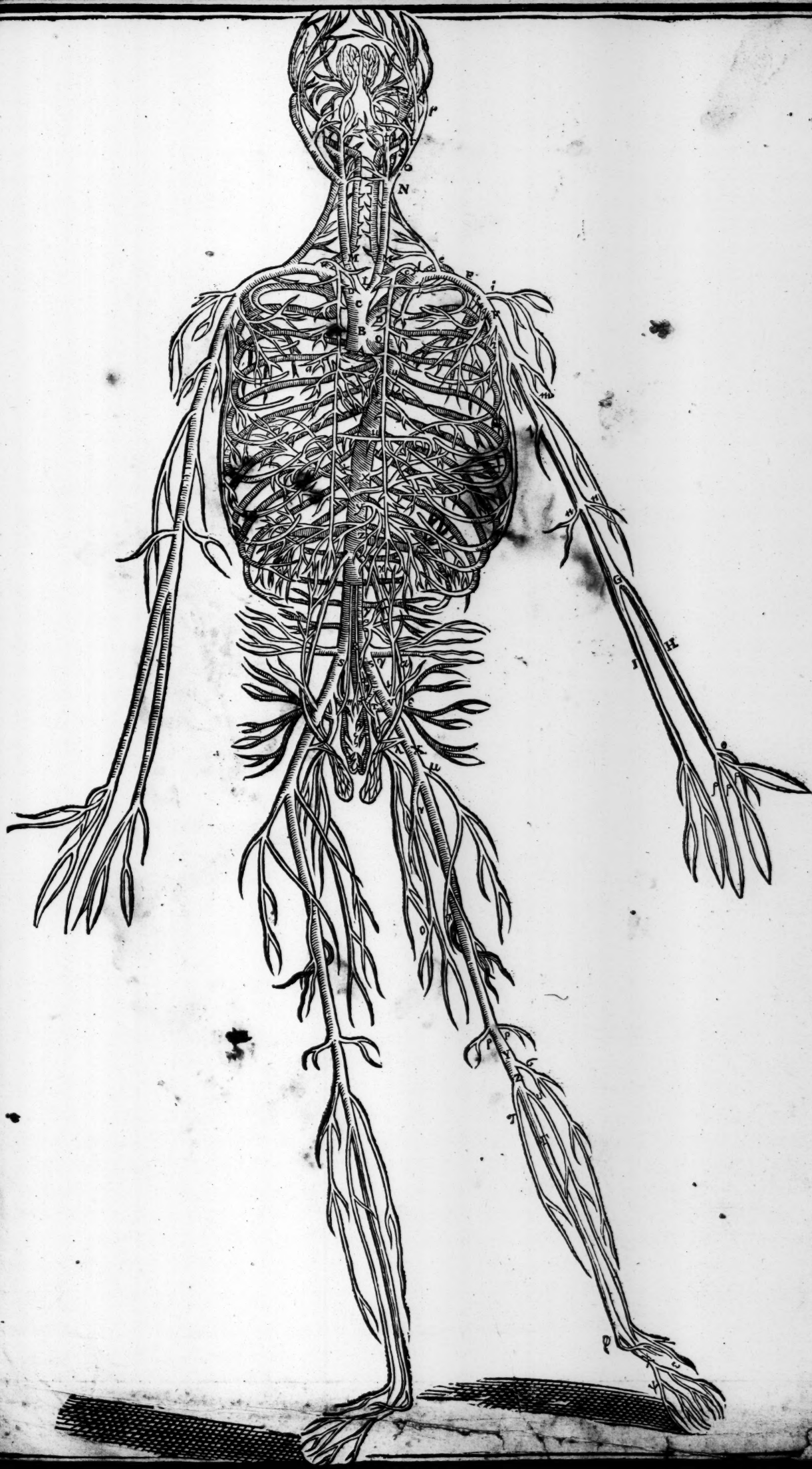
Z The trunk descending by the back-side of the leg.

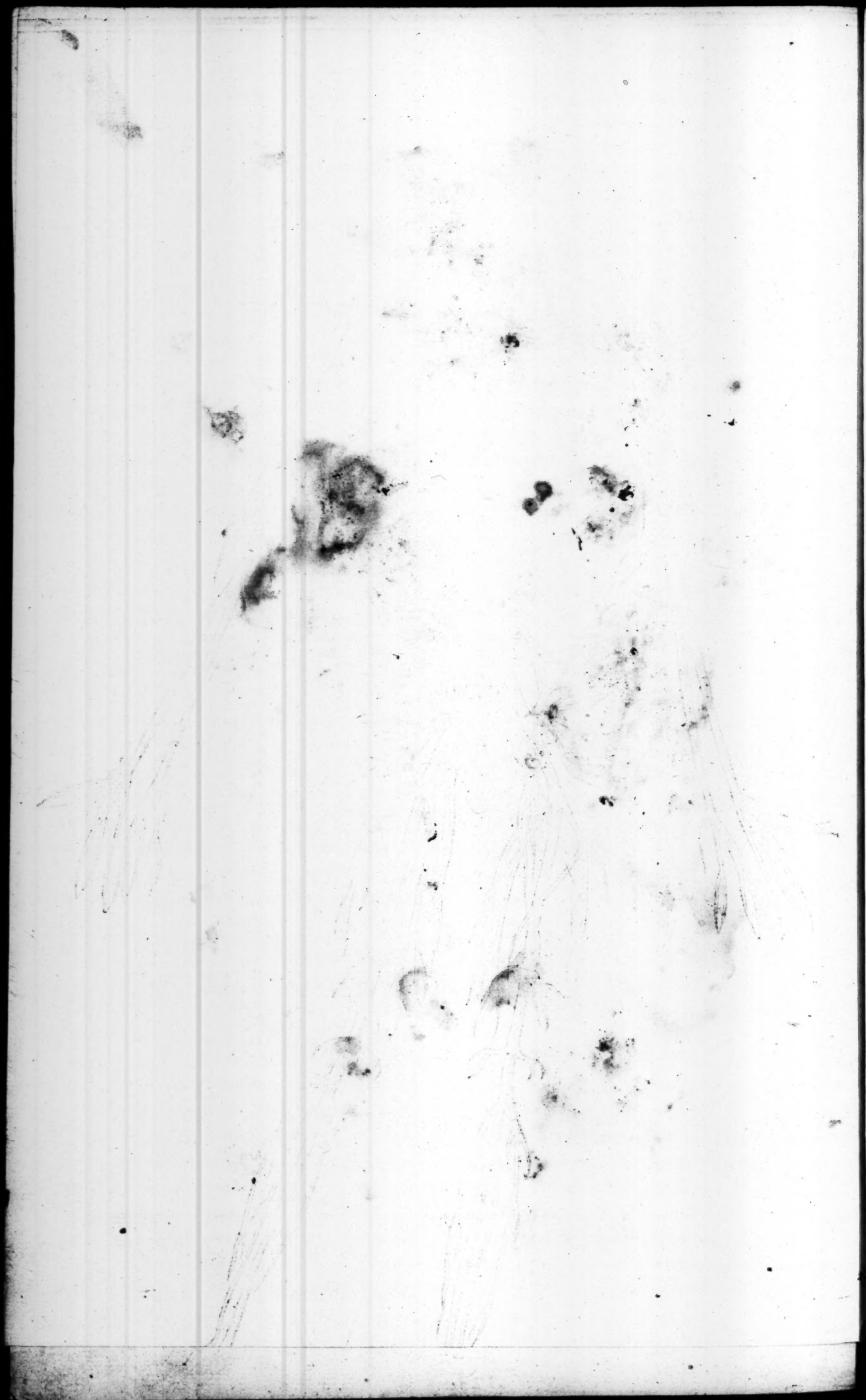
τ A higher branch issuing out of the back-side of the trunk.

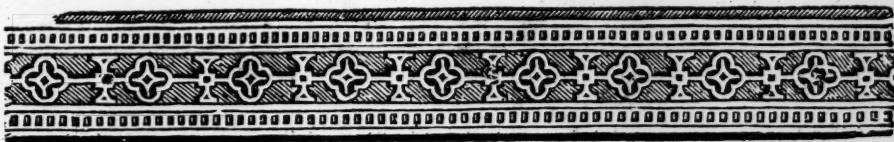
υ A lower branch issuing out of the back-side of the trunk.

Γ The remainder of the trunk descending by the leg, which offers a little branch φ to the inner ankle.

χ The division of the trunk χ into an inner branch ψ, that is propagated to the great toe, and the two next; and an outer, ω propagated to the little toe, and the two next to that.







The third Treatise,

Concerning The N E R V E S.

CHAP. I.

Of the nerves of the brain.



AMong those eight Conjugations, which arise from the marrow of the brain drawn out in length, whilest it is yet contained within the limits of the skull, that offers itself in the first place, which makes the *Optick nerves*, that are so famous among all the Masters of Anatomy. For these are not only the biggest, if you look upon their thicknesse; but also without doubt the softest of all the nerves of the body. But they arise out of the middle of the *basis* of the brain, on the forepart, according to the opinion of the Ancients, but indeed, if the head be turned upside down in the dissection (which is the proper

The first pair of the brain.

Its originall.

way) out of the beginning of the former trunks of the spinall marrow, that their originall is as it were in the back part of the head, and presently each of them by little and little making towards its mate, they are united (not only joyned, as some would have it) over the saddle of the wedg-bone, and make one common square body, the marrow within them being mixt together. After that presently separating again, each of them is carried obliquely into the eye of its own side, entering the orb thereof through the first hole of the wedg-bone, and ending at the very centre of the eye. In this pair we may easily shew those two membranes, which are derived to the nerves from the two meninges of the brain, as also the very inner marrowy substance, which comes from the body of the brain. Yet the nerve it self is not cleft into more branches, (as the other are) but lying hid makes the coats of the eye; and out of the thick membrane it forms that coat, which is called *Cornea*, the horny one; out of the thin membrane that is called *Uvea*, the grapey one; but out of the substance of the marrow the *Retina* or coat like a net. For as soon as it is arrived at the centre of the eye, these membranes are displayed, and making a sphere contain the humors in them. These nerves convey the faculty of seeing to the eyes; wherefore, they being obstructed, or compressed, a blindness ensues. *Galen* hath ascribed holes to them, and *Herophilus* for the same reason called them *τρυπαὶ ὀφθαλμοῦ*, the passages of the sight, teaching that there is a sensible hollownesse plainly to be seen in them, whom for all that almost all Anatomists do contradict. But I have heretofore shewen in the Universitie of *Padua*, and in a great assembly of men, that there are certain passages continuing from the beginning of these nerves, as far as to the place, where they meet together, and presently alter that vanishing away toward the eye. And therefore I shewed that the Ancients may not only be excused, but also that they write the truth, especially when none of them have said, that these passages were great, but only such, as did not altogether escape the sight, if one would make tryall thereof in a great living creature, and by a clear light, and presently after it is killed. For *Galen* himself requires these three conditions, 7. *placit*. 4. and *lib. de oculis*, that one may see them. But before we depart hence, I will bring in some problemes, that, besides the history itself, I may also shew the use of that, which I say, especially when in our time they only for the most part follow the study of Anatomy, who employ their industry in the behalf of Physick. The first therefore shall be, what is the cause, that many upon sneezing often (especially when they have provoked it for the nonce) have of a sodain faln blind. This happens, either because the branches of the sleepy arteries, which are so near to the optick nerves, that they touch, are filled, and being so, presse together those nerves; or else because

Progressi.

Inserion.

Use.

The holes of the optick nerves.

Problemes.

I.

cause a copious, and that a phlegmatick humor has fallen out of the brain into the optick nerves, and obstructed them. I have seen those, that have been blind through the first cause, sometimes cured by a Seton; but I never remember, that any, in whom this arose from phlegmatick humors, have recovered, except one having the French pox, who being anointed with quick-silver, all the humors melting away, was restored to health. But it is not the part of a good and pious Physician, to make use of those things, which, being full of danger, may do more harm, if they prove hurtfull, then they can procure good, if they be profitable. And truly it is better not to cure blindness, then to cause death; although oftentimes rashness helps them, whom reason helps not, as the most elegant of Physicians *Celsus* says elegantly. In the mean time in diseases of the eyes, they who practise Physick, may learn rather to administer those things, which bring the phlegm out by the palat, then to draw the noxious humors to the nostrils. That I may conceal besides the danger which they avoid, that more profit arises from the medicines, that void the phlegm out of the head through the mouth; which both long experience hath hitherto taught, and Anatomy persuades, when the optick nerves in their originall are not far distant from the palat; but farther from the spongy bone, and it is a preternaturall way, by which the humors are carried, as hath been already demonstrated by the learned *Veſalius*. Then it is disputed, by what means the eye can fall out of its orb. the optick nerve not being broke, whereof we have very many histories. But it is not hard to give an answer, to wit, that the nerves may be very much extended in length. Whilest therefore this nerve receives much moisture in the inflammations of the eyes, it easily comes to pass, that it is slackned; but the muscles themselves swelling very much, when they can no longer be contained in the orb, leap forth out of it. For this falling forth of the eyes most commonly proceeds from inflammations; such as are the stories of the most learned *Vega*, who cured a woman in this case by procuring the flux of her terms, and a young man by digesting ointments. But the question is very worthy to be made mention of, and that gives me an occasion to explain it, which I have read in some Authors, that such as were before blind, upon receiving of a wound overthwart the forehead, and some, upon a great looseness of the belly arising on a sodain, have received their sight, and that presently. The cause of their blindness was no other, then the compression of these nerves proceeding from the neighbour vessels, to wit, the veins, and arteries being swollen with blood, which such a wound presently emptied. Wherefore I also sometimes, and not without success, in that species of blindness, which the Barbarians call *Gutta serena*, open the middle vein of the forehead, out of which I draw blood so long, till it ceases to run of its one accord.

The second pair.
Its originall.

The second pair arises, as the ancient Anatomists say, from the sides of the basis of the forepart of the brain, near to the originall of the first pair. But the new dissection shews, that it issues out at the inside of the beginning of the spinall marrow, and that they are so united in their originall, that they make one common angle, which is the cause why both the eyes are moved together to the same sides. It is much smaller, if you compare it with the first pair, and harder, and goes out of the skull through the second hole of the wedg-bone, which is somewhat long, and so it enters the orb of the eye. By and by it is divided into many sprigs, which goe to the muscles of the eye; and the first climbing up above the first pair, or the optick nerves, is disposed of into the two muscles, as well that, which lifts up the eye-lid, as that which lifts up the eye. Another very conspicuous one is disseminated in many surcles into the muscle, which moves the eye inward. The third, no contemptible one neither, being divided first into two fibres, and by and by into more, is sent into the muscle, that draws down the eye: the fourth, into the lower or lesser of the oblique muscles, that rowls the eye about toward the other angle. At length it issues out some thin fibres, which being joined with the first pair are distributed to the outer membranes of the eye, so that this second pair is propagated only to four muscles of the eye, and to that, which lifts up the eye-lid. The use of this pair is, to impart the faculty of motion to the muscles of the eyes.

The third pair.
Its originall.
Branches,
1.

The third pair arises with a very small nerve out of the lower, and hinder part of the marrow of the brain, and runs directly forwards under the basis of the brain, being tyed to the second conjugation, together with which it enters into the orb of the eye through the said second hole of the wedg-bone. By and by it is divided into four branches, of which the first offers a little branch to the upper, and greater of the oblique muscles of the eye, or that called the muscle of the pulley, and then falling out through the hole of the forehead-bone above the orb of the eye, in the skin, and muscle of the forehead, which ought rather to be called the muscle of the eye-brows. This branch is diligently to be taken notice of, because I have long since observed, that, it being hurt with a slight wound the eye-lid fell down, whilest the muscle of the eye-brow by reason thereof fell into a Palsie. I have seen also the same palsie caused by cold, and narcotick medicins, somewhat unreasonably applied for the procuring of sleep. But hence also a reason may be rendred, why *Hippocrates* 1. Prognostic. reckons it among the signs of death in acute diseases to sleep with the eyes half open. For this is an ill sign for that reason, because it signifies, that

An observation.

that the nerves are very much dried, and so the brain itself, whence it comes to passe, that they, who are so diseased, for the most part suffering convulsions afterward dye. In some also a fore-runner of the Falling-sicknesse is wont to arise from the same cause in the eye-lids, the eyes, and the whole face, when this third pair is pluckt by the humors begetting the falling-sicknesse, and so a convulsion of the eyes, and face is caused. *The second* branch is carried downward, and falls out through the hole of the fourth bone of the upper jaw, which is under the orb of the eye, and presently scattering into more propagations, on the forepart of the face, is spent upon the muscles, that move the upper lip, and wing of the nose outward, as also upon the lip itself, and the gums of the teeth, called *Incisoria*, or shredders. *The third* is sent through the hole of the second bone of the upper jaw, behind the caruncle, that is placed in the inner angle of the eye, to the wide cavity of the nostrills, being spread throughout its coat, whereby it comes to passe, that it is indued with a very sharpe sense, and being but lightly touch't causes sneezing. *The fourth* goes out through that crevice, which is betwixt the first bone of the upper jaw, and the wedg-bone, in the outer angle of the eye, or through the fourth hole of the wedg-bone, and departs to the inner side of the temporall muscle. The use of this pair is to convey the faculty of moving to the said muscles.

2.

Use.

The fourth pair arises out of the marrow of the brain on the backside, goes out of the skull through the sixth hole of the wedge-bone, and running straight down, propagates three branches from itself. *The first* is presently after its going out of the skull, which being writhed sometimes about in manner of the tendrells of a vine, or gourd, and united to two sprigs of the Auditory nerve (of which we are to speak next) afterward distributes surcles to the temporall muscle, that lifts up the lower jaw, and that which moves it forward from the head, as also to the muscles of the cheeks. After this the pair running farther down, issues forth a *second* branch, which propagates surcles in order to the gums of the upper cheek-teeth called the grinders, and also to the teeth themselves. *The third* branch issuing forth from the backside of the nerve, and entering the hole of the lower jaw-bone that is bored in the inner surface of it, at the originall of the processes, bestows little branches in order to the roots of the teeth, and at length going forth through the foremost hole in the outer surface is terminated in the lower lip, and skin of it. The remainder of this nerve is spent upon the coat of the tongue near to the root, and so gives it the power of distinguishing savors or tasting.

The fourth pair.
Its originall branches.
1.

But note in this place, that these two pairs which we have now recounted, I say, the third and fourth, are commonly reckoned for one by Anatomists, and that the third; but with this distinction, that they say this very pair arises with a double root; the one smaller, and the other thicker. They call that the smaller root, which we set down for the third pair; that the thicker, which we make the fourth. But we distinguish them, because indeed they are not joined together, neither in their originall, nor in their progress. But that which they account for the fourth pair, seems not to bee distinguished, from the third; as *Valuerda* himself grants, lib. 7. *Anatomie. cap. 4.*

A note.

The fifth pair issues out of the marrow of the brain drawn out in length, on that side whereon a part of the cerebellum or after-brain is joined to it, arising out of two nerves, of which one is softer, the other harder. These go out of the membrane together, and enter the organs of hearing, through the hole of the temple-bone, that is bored in the stony proceesse thereof, being a large one and winding. After this that harder part goes forthwith to the forehead, being carried through a peculiar channell, and returns backward again obliquely through the same bone, and departs into the first cavity of the inner ear. From thence being more reflected, it sends forth two propagations, one higher, the other lower; but both pass through their peculiar holes. *The upper* is carried through the transverse hole of the same bone, through which also a little vein passes into the organ of hearing; and a little after it is come forth of it, is joined with that branch of the fourth pair (as we have delivered; but as other commonly count the pairs of the third) which we told you was writhed about, like the tendrell of a Vine. *The lower* goes out through the third hole of the same bone, which is very narrow and winding; and being carried overthwart above the muscle of the lower jaw, that moves it sidwards, descends into the chops, having disseminated a pretty many propagations into the nostrills. But forthwith it is joined with the propagation of the fourth pair, that resembles the tendrell of a Vine, or that sprig which goes to the tongue, from which it passes to the roots of the teeth, and muscles of the cheeks, as also to the skin that goes about the root of the outer, or little ear. Anatomists do beleve, that by means of this branch it comes to passe, that they who are born deaf, are for the most part dumb also. But that softer part of this pair is carried together with the hard part; and when it is come to that first cavity of the inner ear, it is spread throughout it in manner of a membrane, and so it deserves to bee called the Auditory nerve, as ministring all the spirits, that serve for hearing.

The fifth pair.
Its originall.
Its two parts.

The harder.

The soft part

Its use.

The sixth pair arises somewhat more toward the lower and hinder part, then the fifth, and its originall.

The sixth pair
and its originall.

and not with one, but with many little nerves severed from each other, which for all that are presently joined together, although they do not close so, as to make one only, but two distinct ones alwaies, yet are they contained in one membrane, arising from the *Dura meninx* of the brain, which hath deceived many, so that they have accounted them for one. Being thus joined, they descend both together out of the skull, through the second and third hole of the nowl bone; through which same the lesser branch of the sleepy artery, and the greater of the Jugular vein enter into the skull. There being then two nerves, the one in its egress inclines more to the forepart of the said hole, and is the lesser of the two; the other to the hinder part, and is the greater. That presently after its going forth of the skull, tends straight downward to the muscles of the tongue and chops, and to the parts placed in the mouth, upon which it is wholly consumed.

The lesser
nerve.

The greater
nerve, and its
propagation.

This on the contrary sends its first propagation to the muscles seated on the backside of the neck, especially to the first muscle of the shoulder-blade, called *Cucullaris* or the cowl-muscle, and then adhering to the seventh pair, and the aforesaid artery and vein, by the benefit of certain membranes, it runs down to the sides of the throtle, to whose muscles, especially those seated in the inner cavity, it distributes surcles overthwart. Here many propagations of nerves meeting together, and parting asunder again, a certain texture is made, wherein knots are found not unlike to the glandules, that are tyed to the divarications of the vessels; which was first observed by the most learned Anatomist *Fallopins*, who would have it resemble the body of an olive. But the greater nerve it self going in the middle betwixt those same vessels which I spake of, is carried leisurely from the throtle to the rough artery, and running down at the side thereof, tends to the chest.

The branches
of the greater
nerve.

But before it enters thereinto, it is divided over the hollow of the neck into two branches, of which one is the outer and lesse: the other the inner and greater. We shall now speak briefly of the distribution and propagations of them, but so that being the right trunk is disseminated in another manner than the left, we set down the history of each by it self; and first of the right, then of the left.

The propaga-
tions of the
outer branch of
the right nerve.

1.

2.

The outer branch then of the right nerve sends out propagations presently after the division to the muscle that bends the head, called *Mastoides*, as also to that of the bone *hyoides*, called *sternohyoides*, and that of the *Larinx* or throtle, called *sternothyroides*; after this it enters the cavity of the chest, and when it comes to the axillary artery, issues forth from its inside sometimes three, sometimes two surcles one under another which are returned about the said axillary artery, as it were an axel-tree, or (to say trulyer) a kind of pulley, and closing together make one nerve; which being fastned to the right side of the rough artery, by the benefit of a membrane, runs back from the lower part thereof to the highest, and hasts to the right side of the throtle, leaning upon a glandule, which is placed at the root of the right side. Having past this, it is forthwith divided into many surcles, which are spent upon the muscles of their own side, which are placed in the throtle, and have their heads downward, giving motion to them. And this nerve is called *Recurrent*, the returning one from its progresse, and is very famous among all, being so made by skilfull nature with great wisdom, that it might be inserted into the muscles of the throtle, whose heads look downward, when all the nerves that give motion, ought to be inserted into the heads, and to look towards the end, not on the contrary. And because the throtle is an organ of the voice, but the voice cannot be uttered without motion of the muscles, that either open the cartilages of the throtle, or shut them; therefore these nerves, which impart to the muscles the power of moving and contracting themselves, being either bound hard or cut off, it happens for that cause, that the voice is taken away. This may be very handsomely shewn in dogs, or in a hog, because the one continually makes a noise with barking, the other with grunting. For one of these nerves being cut off, halfe the voice is taken away; but both being cut, it is wholly lost. The recurrent propagation being thus constituted, the outer branch running down obliquely under the hollow of the neck, after that by the way it hath distributed surcles of an indifferent bignesse into the *Pleura*, or membrane of the ribs, and into the coat of the lungs, and given others to the *pericardium* or purse of the heart, and to the heart it self; it descends farther within the duplication of the *mediastinum*, and near to the rack-bones is divided into two branches, which make the right nerve of the left orifice of the stomach, are carried obliquely, and then piercing through the midriff, together with the gullet, to which for all that they afford never a branch, are consumed upon the left orifice of the stomach, with many branches like a little net, and so encompass it together with the left nerve, that it seems wholly to consist of nerves. Hence there is so great a sympathy of the stomach, not only with the brain, but with the heart also; that such diseases, as pain the upper orifice, seem to be of the heart, and indeed so they are, the same heart suffering pain, because of this nerve being pained. And this is the true cause, to wit, the communion of this nerve, not the nearnesse of both the entrails, as others say. The inner branch goes to the inner side of the root of the first rib of the chest, and cleaving to

VVhence the
sympathy is be-
twixt the sto-
mach and heart.
Propagations
of the inner
branch.

the

the rack-bones under the *Pleura*, runs down through the roots of the rest of the ribs, taking to it a little branch from every one of the Intercoastall nerves, that issue out of the back-bone, then passing through the midriff with the Descendent trunk of the great artery it is carried as far as to the *os sacrum* or great bone, at the region whereof it issues out three propagations, which are distributed into the naturall inner parts. *The first* goes to the lower membrane of the Kall, and descending through it is parted into three little branches, of which *one* is distributed to the right side of the same membrane, and to that part of the colick gut, that is joined unto it: *another* the least of them, and a very small one, to the guts *duodenum*, and the *jejunum* about its beginning; *the third* to the bottom of the stomach on the right side, and to the upper membrane of the Kall, which is something the larger. That which remains of this propagation is spent upon the hollow part of the Liver, and the bladder of gall. *The second* goes into the right kidney, and the membrane thereof. *The third*, which is greater then either of the former, descending to the first rack-bone of the loins, reaches into the right side of the mesentery and; into the guts, that are tyed thereto, entering the center of the mesentery in company of an artery, and a vein. The remainder goes into the bladder, and in women into the right side of the bottom of the womb. But the outer branch of the left nerve, saving that in its descent it has offered sprigs both to the *Pleura*, or membrane investing the ribs, and to the coat of the lungs, and that outwardly, as also to the purse of the heart, and heart itself inwardly, at that part of the Descendent trunk of the great artery, where it first issues out of the heart, and is bowed to the back-bone, it sends forth three surcles, which returning to the said artery close together into one nerve, which is called *sinister recurrens nervus*, the left returning nerve, and in like manner as the right one, takes its progresse upward, and is propagated into the muscles of the *Larinx*, or throttle. After this it issues out a small sprig, which is distributed through the *basis* of the heart, and coat of it in manner of hairs. Afterward the remainder descends inclining itself obliquely to the right, and goes to the upper orifice of the stomach, into the right side whereof it is diffused, as the right branch was before into the left side, being divided into many little branches in manner of a net. From this a surcle is carried down along the upper part of the stomach to the *pylorus*, or lower orifice, which when it hath as it were interwoven with some sprigs, it goes into the hollow of the liver. *The inner branch* first of all takes to it propagations from the intercoastall nerves, and then passing through the midriff is divided into three. *The first* of them goes overthwart to the Spleen, and in the way shoots out two sprigs, *one*, which is likewise sent into the lower membrane of the Kall, and part of the colick-gut, which is tyed thereto; *another* into the left side of the bottom of the stomach, and into the upper membrane of the Kall. *The second* propagation goes into the left side of the Mesentery, and the guts of that place; sometimes also it issues sprigs, which run out with the seminary vessels through the processes of the *Peritoneum*, or rim of the belly to the testicles. *The third* goes to the left Kidney, and the fat membrane thereof. The remainder of the branch passes to the left side of the bladder, and of the bottom of the womb. The use of this pair is manifest enough, as being very notorious, when the outer branch bestows little boughs upon the middle bowels, but the inner upon all those of the lowest belly, and the right branch upon those of the right side, the left on those of the left. Besides this use it conduces by the returning branches also to the framing of the voice, by imparting the faculty of motion to the muscles of the throttle.

The seventh pair arises in the utmost part of the nowl-bone, where the marrow of the brain is ready to goe out of the skull, and so is counted the hardest of all the nerves, that have their originall within the skull. But it arises in some roots separated from each other, which joining together on both sides into one, it goes out of the skull through the fourth and fifth holes of the nowl-bone (which are placed betwixt that greatest one, which opens a way for the descent of the spinall marrow, and that, at which the sixth pair goes out) and presently after its egress is involved in one common membrane with the sixth pair: whence some, not so diligently observing it, have beleevd that they were mixt one with another, and thus they descend together. When it comes to the root of the tongue, it distributes surcles into all the muscles thereof, sending over some also to certain muscles of the bone *hyoides*, and of the throttle, as also to those, which take their beginning from the appendix called *styloides*. The use of this conjugation is to carry down the faculty of sense, & motion from the brain, to the muscles of the tongue.

To these seven pairs, which are commonly so numbred, we adde an *Eighth* which makes the nerves of smelling, by which a faculty is derived from the brain of apprehending the odours of things without. These are commonly affirmed to arise out of the marrowy substance of the brain, in the *basis* thereof, near to the first pair; but the new dissection of the brain, and which is performed by turning it upside down, hath taught us, that they arise at the utmost sides of the brain, in that part, which is above the holes of the ears, whereby it is manifest, that hitherto only one half of them hath been shewn. They are very sharp at their originall, and distant one from the other, but going forward by degrees

The outer branch of the left nerve.

Its propagations.
The left recurrent nerve.

Propagations of the inner branch of the left nerve.

1.

2.

3.

Use.

The seventh pair.
Its originall.

Its use.

The eighth pair.

Its originall.

grees, betwixt the uppermost and middle prominence of the brain, they grow thicker, and draw nearer one to another, and so at length they lye down above the *sinus* or cavities of the spongy bone within the skull. These are thrust into the mammillary processes of the brain: but *Galen* and *Marinus*, (whom almost all Anatomists have followed) would not call them by the name of Nerves, although they altogether agree therewith in their colour, course, and use, because they neither have productions like the rest of the nerves, nor go out of the cavity of the skull: but truly they seem to me to commit no other a sophism, then they, who have expelled the teeth out of the number of the bones because they are not invested on the outside with a membrane, as others are, although neither this makes any thing to the essence of the bones, nor that to the essence of the nerves.

CHAP. II.

Concerning the nerves of the Spinall marrow properly so called, and first of those of the Rack-bones of the Neck.

N

ature, the wise parent of all things, as shee hath framed the nerves, that they might serve for the carrying of the faculties, and spirits, that are generated in the brain, because the brain itself could not be diffused through the whole body: so when the same could not conveniently bestow nerves upon all the parts, by reason of their too great distance, shee made the spinall marrow, which is nothing else, but the marrow of the after-brain and brain, extended through the long conduit pipe of the rack-bones of the back. And therefore we having already viewed those nerves, which take their originall from the marrow of the brain, whilst it is yet contained in the skull; it remains now, that we take a view of them also, which come from the spondyls of the back-bone: But it is called marrow, not that it hath any affinity by reason of its substance with the marrow of the bones; but because like marrow it is contained within the rack-bones; but the substance thereof is like that of the brain, which itself also *Plato* called marrow; and it is named the *spinall* marrow, or of the back, to distinguish it from both those, that are not contained in the back-bone, but either in the skull, as the brain, or in the hollownesse of the bones, as that which is properly called marrow. This substance is covered with two membranes, no otherwise then the brain itself is, from whence it takes its originall, the one thick, the other thinner, which are invested with a certain third, strong, and membranous covering, that *Galen* thought to be the ligament of the rack-bones. But it was made to that end, that it might distribute sense, and motion to the muscles, and membranes, to which those pairs of the brain do not reach. Therefore, when there is a good number of nerves arising there from, yet we shall easily reduce them to some certain classes, or companies, if we say that they all make up thirty pairs, of which seven belong to the marrow, whilst it is carried through the rack-bones of the neck; twelve, whilst it is carried through those of the chest; five, through those of the loins; and lastly six to that, which is contained in the holes of the *os sacrum*, or great bone. But these nerves go out through the holes of the rack-bones, and either with a double originall on the fore and hinder part, as it happens in the two first conjugations of the neck, and five of the great bone, which arise not from the sides, that is, from the right, or left part, but issue forth two branches before and behind; or else with a single one, through one hole bored in both sides of the rack-bones, as happens in all the rest of the pairs, in which one nerve issues from the right side, the other from the left. But the first, and second pair have a double beginning, lest if they should arise with a single one, that being somewhat thicker might have been hurt by the joints of the rack-bones; or if the hole should be made larger, the rack-bone (which was small enough of itself) should be liable to breaking. Therefore that both these evils might be avoided, the wise Opificer made a double beginning, one on the forepart, another on the hinder. But the right branches go every where to the right side, the left to the left, and they are distributed on both sides after the same manner.

The first pair therefore [tab. 1. n. 1.] arises with its first, and foremost propagation [tab. 1. B.] from the forepart of the spinall marrow, and passes out betwixt the nowl-bone, and the first rack bone of the neck, near to the sides of that round ligament, wherewith the tooth-like proceffe of the second rack-bone is tyed to the foreside of the nowl-bone, and so it is distributed into the muscles over the neck, and under the gullet, that bend the neck. With the other, and hinder propagation, [tab. 2. Fig. 1. C.] it likewise falls out through the hole, that is common to the nowl-bone, and first rack-bone of the neck, toward the hinder part, but with a double sprig, one of which being small is spent upon the lesser strait muscles, and the upper oblique ones, that extend the head; the other reaches out into the beginning of the muscle, which lifts up the shoulder-blade.

The spinall marrow.

Why it is called marrow.

It is wrapt up in two membranes.

The conjugations or pairs of the spinall marrow.

The first pair of the neck.

The second pair [tab. 1. 2.] with its fore-branch [tab. 1. D₂] (which is slender, then the hinder one, though both of them seem small enough) arising from the fore-part of the marrow goes forth betwixt the first, and second rack-bones at the side of the tooth-like proceffe, which branch is distributed into the muscles, that lie upon the neck, as well as the fore-branch of the first pair, which is wrapped together with it; and is almost wholly spent upon the skin of the face. With its hinder branch [tab. 2. Fig. 1. E.] it slips out through the sides of the backward proceffe of the second rack-bone, but presently is cleft into two branches of unequal bignesse, of which that which is the thicker [tab. 2. f. 1. F.] tends from the forepart to the hinder, where the muscles seated on both sides of the hinder part of the neck do meet together, & there being mixt [r. 2. f. 1. G.] with the third propagation of the third pair of the nerves, it runs out through the middle of the said muscles, returning from the hinder to the foreparts, and so is distributed into all the skin of the head, as far as to the top of the crown, [r. 2. f. 1. H.] as also to the ears. The other branch, which is the slenderer, is inserted into the greater straight muscles, and the lower oblique ones, that extend the head. Galen makes mention of these branches lib. 4. de locis affect. which place we shall not think much to transcribe hither, it making very much to the illustration of the use of this kind of learning. Not long since, says he, they ulcerated the head of a certain man, by laying on medicines vehemently heating, thinking by this means his sense, that was greatly impaired, might be recovered. But we cured this very man, having found out the seat of the disease as well from other accidents, as from the primitive, or procaccitic causes. For we diligently examined him about every one of them, and found that this was one; when he had walked in much rain caused by a violent wind, his cloak was wet about his neck, so that he felt himself affected with a vehement cold in that part; so then if you know, that four nerves ascend from the first racks of the back-bone to the head, from which the skin about it receives its sense; you will easily find out the seat of the disease, that therefore being healed, the skin of the head was healed also, as having no primary disease.

The third pair [tab. 1. 3.] issues out of the common hole in the sides, which is betwixt the second and third rack-bones, and presently after it gets out, is cleft into two branches, of which the more forward one [tab. 1. I.] is subdivided into four propagations. The first [r. 2. K.] goes to the first bending muscle of the neck, or the long one: the second [r. 1. L.] runs down, and being united with a sprig of the fourth pair [tab. 1. Q.] ends in the muscles, that lye under the gullet. The third [tab. 1. M.] climbs up, and joining with the thicker branch of the second pair but now mentioned [tab. 2. f. 1. F.] is spent upon the skin of the hinder part of the head. The fourth [tab. 1. N.] is imparted to the transverse muscles, or to the first pair of the extenders of the neck, and to that, which lifts up the shoulder-blade, of which two muscles that ends in the transverse processes of the neck, this begins therein; and at length it is digested into the square muscle, that draws down the cheeks, which is called by Galen *πλάγιος μύς*. The hinder branch [tab. 2. f. 1. O.] is implanted into the second pair of muscles, that extend the chest.

The fourth pair [tab. 1. numb. 4.] issues out of the common hole of the third, and fourth rack-bones, and like the third pair is divided into two unequal branches. The more forward and greater [tab. 1. P.] is cleft into three other twigs, of which the first [tab. 1. Q.] is joined with another branch of the third pair [tab. 1. L.] and goes to the first long pair of muscles; that bend the neck. Another [tab. 1. R.] goes to the transverse muscle, or first of those, which extend the neck, and to the first of the shoulder-blade, called *Cucullaris*, the cowl-muscle. The third [tab. 1. S.] being smaller then the other, and joyned with a surele of the fifth pair, and another branch of the sixth pair, near to the *mediastinum* or membrane that parts the chest in the middle, and above the *Pericardium*, passes on downward; that out of these three principles the nerve of the midriffe may be made up. The hinder branch [tab. 2. f. 1. T.] goes toward the spine or ridge, under the muscles, which are placed thereabout, to which also it affords a good number of branches, and from thence being led downward between the muscles on both sides of the neck, it is carried to the square muscle, that draws down the cheeks. In this place it is worth our labour to inquire what may be the reason, that they who are troubled with a Resolution, or deprivation of motion in the whole body, have nevertheless the motion of their midriffe for a while free: some make answer, that this happens, because although no spirits are sent over from the brain, yet they may be diffused out of the marrow of the back. But these men beg the question, when we suppose, that no spirits come from hence, because we see that all the muscles of the whole body, to which nerves are sent from the marrow of the back, are resolved or deprived of motion. Therefore I thought fit to seek out for another answer, and to say that the midriffe has two motions, one, that is voluntary, which we use, whilst we breath strongly; another naturall one, when the fibres are extended, and contracted of themselves. A man therefore is preserved by this naturall motion, when we see that breathing is little, and weak, and as much as suffices, that the lungs may be moved a little.

The fifth pair [tab. 1. numb. 5.] goes out betwixt the fourth and fifth rack-bones; and like the two last fore-going, is cleft into two branches. The forwarder of them [tab. 1. U.] issues

forth some propagations. *The first* [tab. 1. betwixt U and 6] goes to the muscles, that bend the neck. *Another* [tab. 1. X] together with propagations of the fourth, and sixth pairs, sometimes also of the seventh, to wit, then when the branch of the fourth is wanting, descends near to the side of the gullet through the forepart of the rack-bones of the neck, and is implanted into the midriff, & so makes the midriff nerve. *The third* [t. 1 Y] is carried through the upper part, and outside of the arm, to the second muscle of the arm, to wit, that which lifts it up, called *Deltoides*, from whence little branches are sent over to the first, and second, that is to the cowl-muscle, & the lifter up of the shoulder-blade. *The fourth* propagation [tab. 1. b] at the neck of the shoulder-blade is cleft into two, of which the former [tab. 1. c] goes into the muscle *Deltoides*, at that part where it arises from the clavicles or canal-bone; the latter and thicker [tab. 1. d] is inserted into the fourth pair of muscles of the bone *hyoides*, called *coracohyoideum*, and from thence imparts a small branch to the upper muscle over the shoulder-blade called *superfascularis*, and to the muscle *Deltoides*, where it arises from the spine of the shoulder-blade. *The hinder branch* [tab. 2. f. 1. e] is written toward the back-bone, and distributed in the same manner, as the hinder branch of the fourth pair is.

The hinder
branch.
The sixth pair.
Its fore-
branch.

The sixth pair [tab. 1. numb. 6] goes out under the fifth rack-bone, and in like manner as the other pairs are, is divided into two branches. *The forwarder and greater* [tab. 1. f] after it has propagated that sprig, [tab. 1. g] which we said is joined with the fourth, and fifth pair, [tab. 1. S and X] to the making up of the nerve of the midriff [tab. 1. i] passing on farther is united with the two next following pairs, the seventh of the neck, and the first of the chest, and is again separated from them, and then again being joined with them it so weaves a certain net-like texture, from which nerves are issued forth, that go to the arm. *The hinder* [tab. 2. fig. 1. l] is carried to the hind muscles, which extend the head, and neck.

Its hinder
branch.
The seventh
pair.
The fore-
branch.
The hinder.

The seventh pair [tab. 1. n. 7] is derived from the marrow of the neck, and issues forth through the common hole of the sixth, and seventh rack-bones. *The forwarder, and greater branch thereof* [tab. 1. m] is joined presently after its egress with the sixth nerve of the neck, and the first of the chest, and for the greater part is carried with the rest to the arm. *The hinder and lesser branch* [tab. 2. fig. 1. n] goes to the muscles, that lye upon the neck, and to the square one, that draws down the cheeks.

also hind

CHAP. III.

Concerning the Nerves of the marrow of the rack-bones of the Chest.

TWELVE conjugations of nerves issue forth from the spinal marrow, whilst it runs through the rack-bones of the back, as the most learned *Vesalius* has rightly opinioned, however there are but eleven holes bored in the twelve rack-bones thereof, as *Columbus* objected, because the first pair passes out between the last rack-bone of the neck, and the first of the back, wherefore it ought to be numbered rather among the pairs of the chest, than those of the neck. All these conjugations after their egress are divided in two; and the one branch which is the greater, always bends forward; the other which is the less is bent to the hinder parts, and to the muscles, that lye upon the back.

The first Pair.
Its fore-branch

The first pair then [tab. 1. numb. 8] of the nerves, which issue forth from the marrow of the chest, goes out of the common hole of the seventh rack-bone of the neck, and the first of the chest, in the same manner, as the five pairs last mentioned do, and in like sort also is forthwith divided into two branches. *The forwarder, and greater* [tab. 1. o] is united, [tab. 1. p] partly with the seventh nerve of the neck, partly with the second of the chest, in that manner, which we have before explained; and so afterward is wholly consumed upon the arms, excepting one propagation [tab. 1. q] which arising at the beginning of it, is joined with the said nerves, and runs into the foreparts, near the length of the first rib of the chest, to the breast bone, bestowing a sprig upon the subclavian muscle, after that being reflected upward it is spent upon the muscles, which take their original from the top of the breast-bone: such are the muscle, that bends the head called *Mastoides*, that which draws down the bone *hyoides*, or *sternohyoideus*, and the first of them which extend the buckler-like gristle of the throttle, called *thyroides*, or the muscle *sternothyroides*. But to the two last sometimes branches are sent over from the sixth conjugation of the brain, and the third of the chest. The same branch also when it has past the arm-pit, being ready to go to the arm, issues forth a certain other propagation from its hinder part, which goes to the muscles seated in the hollow of the shoulder-blade. *The hinder and lesser branch* [ta. 2. fig. 1. r] lies hid under the muscles, which grow to the rack-bones, and imparts some propagations to the second bending muscle of the neck, and to them which extend the head and neck; but when it has attained to the spine of the seventh rack-bone, it goes overthwart to the lower side, and distributes furcles into the first muscle of the shoulder-blade, or that like a Monk's cowl, and into the third of the same, called *Rhomboides*, as also into the upper of the hindmost saw-muscles.

Its hinder
branch.

The

The second pair [*ta. 1. num. 9.*] breaks out betwixt the first and second rack-bones of the chest, and is cleft likewise into two branches. The forwarder [*t. 1. s.*] is united with the first pair of the chest; and thus the first and second pairs of the chest are united by turns, with the fifth, sixth, and seventh of the neck, that the one are not discerned from the other; but make a net not unlike to those strings which hang at Cardinals hats; from which afterward all the nerves that go to the arms, issue forth, and take their originall. This spreads out a branch [*t. 1. t*] which goes forward through the first distance betwixt the ribs, according to the course of the first rib, as far as to the breast-bone, making the first Intercostall nerve, from which furcles [*t. 1. u*] are distributed into the muscles that lie upon the chest. The hinder branch [*t. 2. f. 1. x*] has the same dissemination with that of the foregoing pair.

The other ten pairs [*tab. 1. numb. 10, 11, 12. and so on to 19 inclusively*] of the nerves of the chest, observe the same manner both of their rise, and distribution. For they all issue out of the common holes of the rack-bones at the sides, and presently after their egress are cleft into two branches of unequal bignesse, one of which is the forwarder and greater; the other, the inner and lesse. The forward branches [*ta. 1. y.*] (which make the nerves between the ribs) are carried into the fore-side, and each of them affords a little branch in order according to its length, to the inner branch of the sixth pair, which descends under the *pleura* to the roots of the ribs. These branches are joined with the Intercostall veins and arteries; together with which they passe along the rib to the forepart through the *sinus* or channel, which is cut out on the lower and inside of the ribs. But they which belong to the true ribs, go on as far as to the breast-bone; but they which belong to the bastard ones, are carried into the forepart of the *abdomen* above the *peritonæum* or rim of the belly. From these nerves many branches are disseminated into the muscles between the ribs, not only in the inner, but the outer ones also, as well as into the others, [*ta. 1. z*] which lye upon the chest; such as are the fourth, and fifth muscles of the shoulder-blade or the two formost saw-muscles, as also the broad one, called *Latissimus* [*tab. 1. β*] that moves the arm backward from the breast. In like manner a propagation goes from the fifth Intercostall nerve, about the middle of the rib, passing through the Intercostall muscle, into the first pair of the muscles of the *abdomen*, [*ta. 1. α*] as also into the skin of the chest; and being divided in four parts is distributed into the pectorall muscle that moves the arm forward to the breast, and also into the skin, from which some sprigs doe afterward goe to the nipples of the breast [*ta. 1. γ*] and impart to them a very sharp sense. The hinder branches [*ta. 2. f. 1. δ*] goe backward to the spine, or ridge, between the muscles going to the rack-bones, which have the charge of extending the chest. Yet are they not wholly spent upon these muscles, but when they have now attained to the tops of the spines, they fall out between the muscles of both sides, whereabout they are joined to one another, and so afterward they give nerves to all the muscles, which arise out of the tops of the spines of the rack-bones. Such are the first extending muscle of the head, called *Triangularis*, or *Spleneus*; the third muscle of the shoulder-blade, or *Rhomboides*; the first of the shoulder-blade, or *Cucullaris*; the third broad muscle that leads the arm away from the breast, called *Aniscalptor*, and the hinder saw-muscle. A good number also of furcles are distributed into the skin of the back.

CHAP. IV.

Concerning the nerves of the marrow of the rack-bones of the loins.

From the spinall marrow, whilst it is carried through the loins, although there be only four holes, yet five pairs issue forth, the first being between the last rack-bone of the chest, and the first loins. But they go forth through the common holes, and being gone forth, are distributed in like manner as we have said of the nerves of the chest; when from every one of them, presently after its going out, one branch, and that the greater, spreads it selfe forward; the other, and lesse backward. The formost branches run to the muscles of the *abdomen*, or outer, and forepart of the lowest belly; the hindmost to them, which lie upon the spines of the rack-bones, and the bones without a name, from whence they impart some little branches also to the skin that covers the loins. But the fore-branches are knit together, the first with the second, the second with the third, the third with the fourth, and the fourth with the fifth in the same fashion, as we said the nerves of the arm were, whilst they make the net-like complication.

The first pair then, [*ta. num. 1. 20.*] as the rest do also; going out under the *peritonæum*, or rim of the belly, through the common hole of the rack-bones, which is betwixt the last rack-bone of the chest, and the first of the loins; presently after its egress is cleft into two branches. The fore-branch, which is greater, goes into the fleshy parts of the mid-risse, and into the beginning of the first bending muscle of the thigh, called *Ischiocruralis*.

- The hinder one. From this nerve a certain furcle [ta. 1. 39.] takes its beginning, reaching out for the most part with the preparing artery to the testicle. The hinder branch [ta. 2. fig. 1. xu. 42.] sends propagations into the muscles that lie upon the backside of the rack-bones of the loins, such as are the first and third of them which extend the chest, that being called *Dorsi longissimus*, this *sacrolumbus*; as also the muscle which extend the loins: but when they issue out from the tops of the spines, whereabout the said muscles are joined one to another, they run to the sides, and are implanted into the broad muscle, that leads the arm outward from the breast, called *Latissimus*.
- The second. The second pair [t. 1. n. 21.] goes out under the first bending muscle of the thigh, called *Ilias*, betwixt the first and second rack-bones of the loins. The fore-branch thereof is distributed to the second bending muscle of the thigh, that fills up the cavity of *os Ilium*, or the hanch-bone, and the first bending one of the leg, called *Fascialis*, as also to the skin of the thigh. The hinder branch going out of the abdomen is distributed to the three muscles that extend the thigh, or the *Glutei*; and to that which extends the leg, called *Membranosus*, the membranous muscle.
- The third. The third pair [t. 1. n. 22.] issues forth likewise under the first bending muscle of the thigh, betwixt the second and third rack-bones. The fore-branch thereof passes over near to the hanch bones, distributing two propagations; one which goes to the knee, and its skin; another [t. 1. 51.] which accompanies the vein of the inner ancle, called *saphena*. The hinder branch is reflected and disseminated into the muscles which lie upon the loins.
- The fourth. The fourth pair [t. 1. n. 23.] is the greatest of all the nerves of the loins, and being carried under the said muscle that bends the thigh, as also under the *os pubis*, or share-bone, accompanies the Crurall vein and artery.
- The fifth. The fifth and last pair [t. 1. n. 24.] issues out betwixt the fourth and fifth rack-bones; the fore-branch whereof passes through the hole which is betwixt the hip-bone, the *os pubis*, or share-bone, and the *os Ilium* or hanch-bone, and distributes some propagations to the two muscles that turn the thigh about, called *Obturatores*, others to the second and third bending ones of the thigh, and others to the muscles of the yard. The hinder branch goes into the muscles, and skin upon the rack-bones.

CHAP. V.

Concerning the nerves of the marrow of *os sacrum* or the great bone.

The first pair. **L**AST of all from the marrow which is contained in the rack-bones of the *os sacrum*, the six last pairs of the nerves of the spinall marrow do issue forth. The first of these [t. 1. n. 25.] goes out betwixt the last rack-bone of the loins, and the first of the great or holy bone, in the very same manner as the rest, that arise out of the rack-bones of the loins, and likewise after the same sort is divided into two branches. The fore-branch although it be mixed with the crurall nerves, sends yet a fuscule [t. 1. 43.] over near to the inner region of *os Ilium*, and is dispersed into the muscles of the abdomen, and into the second bending one of the thigh. The hinder [t. 2. f. 1. n. 44.] is disseminated into the muscles that arise from the *os Ilium* or hanch-bone, and especially into the first of them, that extend the thigh, or the greater *Gluteus*, as also into the skin of the buttocks.

The other five pairs. The other five pairs have something proper to themselves; so that before they go out of the bone, they are every of them double on each side, and so from every one of them a double branch is carried on each side, one to the forepart, another to the hinder. The three uppermost of the fore-branches, as that of the first pair also, go to the *Crus*, or parts of the body below the buttocks: the two lowest go into the muscles of the fundament and bladder; and in women to the neck of the womb, in men to the yard; but in both sexes to the outer privy parts. The hinder branches are distributed to the muscles seated on the backside of the bones *Ilium*, and *sacrum*. Of this sort are the first and third extending muscles of the chest, or *Dorsi longissimus*, the long muscle of the back, and *sacrolumbus*, that which bends the loins, called *sacer*, and the broad muscle that leads the arm away from the breast; as also the three which extend the thigh, being the authors of the buttocks, and therefore called *glutei* the buttock-muscles. And this is the utmost end of the spinall marrow, which reaching into the rump-bone, called *os coccygis* is in this manner terminated: And this is the history of the thirty pairs of the nerves which go out of the spinall marrow, which is diligently and accurately to be committed to the memory, that we may know to what place remedies ought to be applyed, if at any time from some externall cause, as by a fall from aloft, or a bruise, or some notable compression, any part shall have lost either motion, or sense, or both. For the remedies must be applyed alwaies to the beginning of that nerve, not to the place, in which the symptome is perceived.

CHAP. V I.

Concerning the Nerves which are distributed through the Arms.

These nerves being now enumerated, which are dispersed through the muscles of the three bellies, and the parts contained in them; it remains that we describe those also, which are propagated through the *artus*, or extrem parts of the body. Here we meet with them first, which are distributed through the arms, whereof there are six pairs commonly set down by Anatomists arising from the fifth, sixth, and seventh pair of the nerves, that come out of the marrow of the neck, and from the first, and second of those, which issue out of the chest. These nerves go out through the common holes of the rack-bones, on both sides, and presently after their going out are united one among another with their forwarder, and greater branches, by and by are separated one from another again, and joined again, and finally separated, so that they seem to make out a neck of the net-like texture, which cannot be better likened then to those strings of Cardinals hats. This implication of nerves goes forth under the clavicle, or collar-bone, about that place, where the axillary veins and arteries go out of the hollow of the chest, and from this all the nerves of the arm take their originall. But their rise is very uncertain by reason of their being so knit together, wherefore wee in our relation of them will rather follow the footsteps of other men, then our own observations, lest wee should seem to affect new opinions rashly, and without necessity.

The first nerve then [tab. 1. c] which is carried to the arm, is a double propagation, namely the third, and fourth of the fore branch of the fifth pair of the neck. For the one of the arm. branch [tab. 1. Y] is carried to the second muscle of the upper part of the arm called *Deltoides*, and to the skin that lies upon it: the other [tab. 1. b] goes toward the neck of the shoulder-blade, where it is cleft into two branches; the former of which [tab. 1. c] goes into the muscle *Deltoides*, where it arises from the collar-bone; the latter [tab. 1. d] is inserted into the fourth pair of the muscles of the bone *hyoides* called *coracohyoideum*, and from thence affords a little branch to the upper superscapular muscle, and the *Deltoides*, at what place it arises from the spine of the shoulder-blade. This nerve runs out through the higher side of the arm; but the other five are carried through the arm-pit into the arm, and in the same are scattered into more branches.

The second nerve [tab. 1. 2] is thicker, and takes it originall from that net-like complication, of which we spake, yet, from what nerve cannot be evident enough. This is carried down through the middle, and fore-part of the arm; into which it enters under the first bender of the cubit, or the double-headed muscle, at that part, where its two heads are united one with the other, and where the tendons are inserted both of the pectoral muscle, that leads the arm forward to the breast, and of the *Deltoides*, that lifts it up. Being hid then under this muscle it sends forth two propagations [tab. 1. n] one of each side, which enters into the two heads of the muscle *biceps*; and after that about the middle of the length of the upper part of the arm, going under the same double-headed muscle, it shoots forth another sprig [tab. 1. +] by means whereof it is joined with the third nerve; and from thence descending it distributes in its progress a furcle [tab. 1. 6] from its outside to the head of the longer of the two muscles of the *radius* or wand, that turns the palm of the hand downward. When it is now come to the bending of the cubit, being led to the fleshy membrane, near to the outside of the tendon of the said double-headed muscle, it is distributed into the skin, being divided into two branches, of which one is the outer, the other the inner; that is the slenderer, this the thicker. The outer then [tab. 1. 1] being carried down a good way with a branch of the Cephalick vein through the inside of the cubit, is distributed [tab. 1. 2] to the second bone of the thumb. The inner branch [tab. 1. 2] is subdivided under the common vein of the arm, or the middle one, called *Mediana*, into two branches, the outer whereof [tab. 1. 3] going on obliquely under the skin leaving the vein goes away toward the *radius* as far as to the wrist: but the inner [tab. 1. 4] being fastened to the inner branch of the Cephalick vein, when it goes more obliquely, in the region of the cubit is cleft into two speciall branches, of which one [tab. 1. 5] is distributed through the region of the lesser bone of the cubit, the other [tab. 1. 6] through the region of the greater bone to the wrist, and from thence, that being past, into the skin of the inside of the hand.

The third nerve of the arm [tab. 1. 7] or the third, which is carried to the arm, lies next under the second, and in like manner with it arises from that net-like texture. This nerve, whilst it passes through the arm-pit, before it has yet attained to the arm, brings forth

forth a propagation, [tab. 1. σ] which is dispersed under the skin betwixt the Pectorall muscle, that leads the arm to the breast, and the muscle *Deltoides*, that lifts up the same. But when it hath first attained to the arm, it hides itself under the muscle *Biceps*, or first bender of the cubit, and passing on downward together with the second nerve, it sends out a little branch [tab. 1. τ] into the head of the second bending muscle of the cubit. After this descending it receives a branch [tab. 1. υ] from the second nerve, by means whereof they are joined one with the other, and then it goes farther through the forepart of the arm unto the bending of the cubit, being always equally distant from the second nerve, and is carried into the protuberation of the inside of the arm, and the fore-part thereof. When it hath past this, it issues forth many propagations, [tab. 1. φ] which together with the branches, that are derived from the fifth nerve, which is carried through the hinder region of the same protuberation, are distributed into the muscles, that are seated on the inside of the cubit, and arise from the inner protuberation of the arm: such are the two, that bend the uttermost bones of the fore-fingers, and that, which bends the third joint of the thumb. After this it sends out another propagation, which is carried down between the said muscles through the *radius* together with a vein, and artery, to the wrist, and passing through under the transverse ligament, scatters some small sprigs into the muscle, that moves the thumb outward from the fingers, and the two, that bend the first joint of the same. After this when it is come to the palm of the hand, it is divided [tab. 1. χ] into three branches; the first of which scatters two twigs into the thumb, the second as many into the fore-finger, the third sends one to the middle finger on the inside.

The fourth.

Its propagations.

Its two branches.

The outer.

The inner.

The fifth nerve

The fourth nerve [tab. 2. fig. 1. ↓] is the biggest of all them, which are carried to the arm, as being almost thrice thicker than the rest. This arises, as well as the other, from the net-like complication, and from thence is carried down through the arm, in like manner as the third is, lying deep every where among the muscles, having the basilick-vein, and axillary artery for its companions. But presently after it hath entered the arm, it derives many, but small sprigs [tab. 2. fig. ω] into the heads of the muscles, that extend the cubit; and before it is come to half the length of the upper part of the arm, it is contorted obliquely downward to the bone thereof, and passes on betwixt that, and the muscles, which extend the cubit. But before it be wholly reflected, it sends forth a surcle [tab. 2. fig. 1. Γ] from its inside, which goes betwixt the said muscles, as also the second of them, that bend the cubit, and is spent upon the skin, that clothes the inside of the arm, some fibres being propagated upward, and downward. Having disseminated this propagation it goes by degrees through the hinder part to the outside of the arm, being carried through the cavity of the outer protuberation of the upper bone of the arm; that is cut out in the back-side thereof, where likewise it sends out a surcle, [tab. 2. fig. 1. Δ] going to the skin, that covers the lower part of the outside of the arm; and then another [tab. 2. fig. 1. Θ] which is distributed into the skin, as far as to the wrist. After that near to the joint of the cubit it is divided into two branches, an outer, and an inner one, which being hid deep, and among the muscles, as the whole trunk also, descend to the wrist. The outer branch [tab. 2. fig. 1. Λ] goes along the *radius*, or wand, and when it is come to the wrist, passes through the transverse ligament, on the outer part, and by and by is subdivided [tab. 2. fig. 1. Ξ] into two branches, of which one goes with a double sprig into the outside of the thumb, the other is spent partly upon the fore-finger, partly on the middle one. But the inner branch [tab. 2. fig. 1. Π] reaching along the cubit scatters more propagations, the first [tab. 2. fig. 1. Σ] into the first muscle that extends the fingers, the second [tab. 2. fig. 1. Φ] into the second, that extends the fingers; the third [tab. 2. fig. 1. Ψ] into the inner muscle, that extends the wrist. But in its progresse [tab. 2. fig. 1. Ω] it affords propagations to the three beginnings of the muscles, that take their original from the *ulna*, or greater bone of the cubit. The remainder of it ends in the wrist, [tab. 2. fig. 1. 31].

The fifth nerve [tab. 1. numb. 32] arising lower than any of the fore-mentioned, out of same net-like complication, and being joined to the fourth, descends through the inside of the arm, between the muscles, that bend, and extend the cubit. This scatters no propagation from itself, but remains intire, till it be come to the inner protuberation of the arm, at whose hinder cavity it is reflected, and is distributed afterward in the same manner with the third nerve, which passes through the fore-side of the same protuberation. For both of them bestow propagations [tab. 1. 33] upon the muscles, which grow out of the inner protuberation of the arm, and keep the inside of the cubit. It issues forth a propagation also [tab. 1. 34] which being carried through the *radius*, or wand; goes between the muscles, which bend the second, and third joints of the fingers, and so to the palm of the hand, & sends out the first branch, which being parted in two is implanted into the inside of the little finger; then another, which being also cut in two goes into the ring-finger, and at last another that goes to the outer part of the inside of the middle finger. But from this same fifth nerve, and from the outside near to the middle of the length of the *radius*, or wand, there grows out a certain other surcle, [tab. 1. 35] which being divided into three branches is disseminated into the outer part of the middle, the ring-finger, and the little one.

The

The sixth nerve [tab. 1. numb. 36.] issues out of the lowest part of the net-like complication, and going through the arm-pit, and inside of the upper part of the arm, & of the cubit, under the skin it makes hast to the inner protuberation of the upper-bone of the arm, dispersing many furcles in its way to the neighbouring skin. [t. 1. 37. 37.] But as soon as it has attained to this protuberation, it is cleft into many propagations, some of which lie under the branches of the basilick vein, some lie over, and so being carried under the skin, when they are come down to the wrist, they end [ta. 1. 38.]

CHAP. VIII.

Of the nerves that are distributed through the Crura, or thighs, legs, and feet.

THere are four pairs of nerves, which are propagated through the Crura. They arise from the three lower conjugations of the loins, and the four upper ones of the Os sacrum, or great bone, which after they are gone through forth the common holes of the rack-bones, as well as the nerves, which are distributed through the arm, make a certain complication like the meshing of a net, but far greater then that other. Nor are these nerves of equall bigness, but the first [ta. 1. n. 46.] and the third [ta. 1. 56.] are small, wherefore also they reach but to the thigh; the second [t. 1. 50.] is somewhat thicker, and reaches to the leg; but the fourth [t. 1. 61.] alone is thicker then the three other put together; and is carried down as far as to the utmost ends of the toes.

The first nerve then [ta. 1. 46.] growes out of the higher part of the net-like complication, where the third nerve of the loins is joined with the fourth [ta. 1. 47.] But it is presently carried downward under the rim of the belly, to the thigh; lying upon the outside of the tendon of the first bending muscle of the thigh, to which when it is come, it sends out a propagation [ta. 1. 48.] which runs out through the skin on the forepart of the thigh, as far as to the joint of the knee, and there ends, and offers furcles [ta. 1. 49.] to the first bending muscle of the leg, as also to the second and third, that extend the same.

The second nerve [t. 1. 50.] arises out of the same complication, and below the first, over against the connexion of the third and fourth rack-bones of the loins. This together with the crurall vein, and artery, (which are the outer Iliacall branches) descends through the groin into the thigh, which when it has attained to, presently it issues forth a notable propagation [ta. 1. 51.] from its inside, lying upon the saphena or vein of the inner ankle, on the forepart, all the way it goes under the skin through the inner parts of the crus to the great toe. But as the vein saphena it self distributes some sprigs in the way to the skin next to it, so also this nerve sends out many propagations, of which that is the chief [t. 1. 53.] which it gives to the foreside of the knee. But the trunk it self [t. 1. 54.] when it has sent out this propagation, passes together with the trunk of the crurall vein and artery into the thigh, and is scattered into the muscles seated on the inside of the thigh, especially [t. 1. 55.] into the third bending one of the thigh, and the fourth extending one of the leg, and so afterward it is terminated above the knee.

The third [t. 1. n. 56.] grows out of the complication, under the second, over against the conjunction of the fourth and fifth rack-bones of the loins. This nerve being carried down upon the second bending muscle of the thigh, called *Iliacus internus*, passes through the hole of the share-bone, and affords propagations [t. 1. 57.] to the two muscles, that turn the thigh about, which they call *Obturatores*, the stoppers, to wit, of that said hole, as also to the two muscles that erect the yard, which arise out of the bone of the hip. From thence like the two foregoing nerves, it descends, and distributes little nerves into the skin, that clothes the inner part of the thigh [t. 1. 58.] The remaining part [t. 1. 57.] lies deep, the chief propagation whereof [t. 1. 60.] is spent partly on the second, partly on the third muscle that bend the leg.

The fourth nerve [t. 1. n. 61.] is made up out of the fore-branches of the four upper pairs of the great bone being united together. By reason whereof it passes the rest, yea and all the nerves of the whole body, not only in thicknesse, but in hardnesse also, as being made of the last, that issue out of the spine, or ridge. This enters into the hinder part of the thigh through the cavity, that is in the hinder part of the hip-bone. But presently it sends forth a notable propagation [t. 1. 62.] from its back-side, which staves a pretty while under the first extending muscle of the thigh, or *Gluteus magnus*, the great buttock-muscle, and from thence is dispersed into the skin that covers the buttocks, and the back-side of the thigh to the middle of its length. Then it sends other propagations [ta. 1. 63.] on both sides, three for the most part to the heads of the third, fourth, and fifth muscles that extend the leg, and to the third bending one of the thigh. After this the trunk of the nerve descends among the muscles seated on the hinder part of the thigh, near to the bone, as far as half the length thereof, and distributes another branch [t. 1. 64.] to that fleshy lump of the fifth bending muscle of the leg, called *Biceps*, which grows to it on the inside,

Its division.

inside, after it has gone beyond the middle of the thigh. From hence also other furcles proceed, which are distributed into the skin on the backside of the thigh. But the trunk it self proceeding farther on, at length attains to the knee betwixt the two heads of the bone of the thigh, and imparts a small branch [t. 1. 65.] on each side into the first extending muscle of the foot, and the sole muscle, called *plantaris*, and by and by is divided, [t. 1. 66.] into the inner cavity of the knee, or in the ham into two unequal branches, which are distributed alone through the leg and foot. For there is not any nerve which runs out through the leg, besides these two branches of the fourth; if you except only that notable propagation, which being derived from the second nerve, as we have said, descends in company of the vein *saphena*, through the inner part of the *crus*. The outer branch [t. 1. 67.] is the smaller, and goes toward that part where the upper *apex* of the *fibula*, or lesser bone of the leg is joined with the *tibia*, or greater bone thereof, scattering a propagation [t. 1. 68.] in the way, which goes to the outer ancle under the skin, distributing in the mean time, many sprigs to the skin. But the branch it self [ta. 1. 69.] passes between the muscles seated on the fore-side of the leg, and going through the long ligament of the *tibia* and *fibula*, or two bones of the leg, passes together with the tendons of the muscles that extend the toes, under the transverse ligament, and disperses little branches to the sides of the upper part of the toes. The inner branch [t. 1. 72.] is carried down through the backside of the *crus*, lurking betwixt the muscle of the sole of the foot, and the first of them, that move the foot obliquely, as also the long bending muscles of the toes; and being joined afterward with the branch of the outer, which passes through the ligament, it goes to the sole of the foot, and distributes propagations in both the sides of the lower part of the toes.

FINIS.

AN



An Explanation of the two Tables of the Nerves.

The thirty pairs of the nerves of the marrow of the brain, whilst it is carried through the spine or ridge, are exprest in these two Tables the present & the following one. Wee have inscribed common characters on both of them; though many also bee peculiar to one; after which we have presently set the number of the Table. But the first shews the rack-bones of the spine and the nerves that issue from thence on the fore-side; the second on the back-side.

NU. I. T. I.

&c.

8 as far as

20 as far as

25 as far as

A ta. I.

&c. 2.

I. I.

B I. C. 2.

2. I. D.

E 2.

E 2. F 2.

G

H

3. I.

I. I.

K. I.

M. I.

N.

O 2.

4. I.

P. I.

Q. I.

R. I.

S. I.

T. I.

5. I.

V. I.

X. I.

Y.

a. I.

b. I.

c. I.

d. I.

as far as to 7. The seven rack-bones of the neck. to 19. The twelve rack-bones of the chest. to 24. The five rack-bones of the loins. to 30. The six bones of the os sacrum. These same figures do stand for the pairs of the spinall marrow.

The seat of the spinall marrow, where it first enters into the rack-bones.

The first pair of the neck, whose forwarder propagations is B; the hinder C.

The second pair, whose fore-propagation is D, its hinder E, from this two branches grow out; the slender one marked with the letter E, the other thick one with F, which is mixed with a branch of the third pair M, about G. But the course thereof to the skin of the crown, and back-side of the head is marked with the letter H.

The third pair of the neck, whose fore-branch I is divided into four propagations. The first K is implanted into the muscles, that bend the neck. The second L is mixt with a twig of the fourth pair Q. The third M is mixt with the thicker propagation of the hinder branch of the second pair F. The fourth N is inserted into the muscles that are joined to the transverse processes of the rack-bones.

The hinder branch O.

The fourth pair of the neck, whose fore-branch P is cleft into three propagations. The first Q joins with the second propagation of the third pair L. The second R goes into the transverse muscle of the neck. The third S.

The hinder branch T.

The fifth pair of the neck, whose fore-branch V issues out some surcles. The first goes to the muscles that bend the neck, being to be seen in the first table between V, and the number 6.

The second X making the greatest part of the nerve of the midriff. The third Y goes to the muscle Deltoides, of which there is a propagation, a, which goes to the skin, that covers the muscles Deltoides, and Biceps. The fourth b, at the neck of the shoulder-blade is cleft into two branches; one of which, c, enters into the muscle Deltoides, at what part it grows out of the Collar-bone: the other, d, is implanted into the same, in the place where

e 2.

6. I.

f I.

g I.

h I.

i. I.

l 2.

7. I.

m I. 2.

8. I.

o I. p I.

q I.

r 2.

9 I.

t I.

u I.

x 2.

IO, II, 12

&c. to 19

inclusively I.

y I. x I.

a I.

β I.

γ I. δ I.

ε I.

ζ I.

η I.

†.

θ I.

ι I.

κ I.

λ I.

μ I.

ν I.

ο I.

π I.

ρ I.

σ I.

τ I.

υ I.

φ I.

it grows out of the spine of the shoulder-blade.

The hinder branch, e.

The sixth pair of the neck, whose fore-branch f, when it has propagated that circle g, which with the fourth and fifth pair, S and X, makes the nerve of the midriff, is joined with the two following, h, and thus it makes up the nerve of the midriff i, so that this arises out of three surcles S, X, and g. The hinder branch l.

The seventh pair of the neck, whose fore-branch is m, its hinder one n.

The first pair of the chest, whose fore-branch o, is united, p, with the seventh pair of the neck, and second of the chest, spreading a propagation q, through the upper side of the first rib. The hinder branch r.

The second pair of the chest, whose fore-branch sends forth a surcle t, running out through the first space between the ribs, and sending surcles u to the muscles of the chest.

The hinder branch x.

The paires of nerves from the ninth to the twentieth, which have the same series of propagations, and especially to the distances of the ribs. The fore-branches of these (fig. 1.) are scattered into the muscles seated on the fore-part of the chest, and partly into their upper region, as y, partly into their lower z, which in women go also to the breasts; and then they send other surcles into the heads of the oblique descending muscles of the abdomen a, and into that which leads the arm from the breast β, another goes to the nipple of the breast γ. The hinder branch δ.

The first nerve that goes to the arm, which is scattered into the skin of the outside of the arm.

The second nerve that goes to the arm, whose two first propagations η goe to the two heads of the muscle Biceps: then it joins with the third nerve by a surcle †. Thirdly, it carries a propagation to the longer muscle that turns the palm of the hand downward θ. But about the bending of the cubit it is divided into two branches, an outer ι, and an inner one κ. That ι descending along the radius or wand, is inserted at the outside of the second joint of the thumb λ. This κ is by and by subdivided into an outer μ, and an inner branch ν. This ν is again cleft in the region of the cubit into an outer branch ο, and an inner one π.

The third nerve entering the arm ρ, before it attains to the arm, scatters a sprig betwixt the Pectoral muscle, and Deltoides σ. By and by having entered the arm, it distributes another, τ, into the second muscle that bends the cubit. After that descending it receives a branch from the second nerve υ; when it is past the bough of the arm, it is distributed into many surcles

1. 1. Surcles 1, at length about the palm of the hand it is divided into three branches X.
 2. The fourth nerve entering the arm, which is the greatest of all them that goe to the arm, is not marked with any letters in the second table, but in the third only, lest the second should be too much blurred with Letters. This sodainly after it has entred the arm, reaches out small sprigs into the muscles, that extend the cubit, then another into the inner skin, upwards and downward T. and another into the lower part Δ, and another Θ, which goes as far as to the wrist. After this near to the height of the arm it is divided into two branches, an outer one Λ, and an inner Π That Λ about the transverse ligament is again divided in two E. This Π reaching all along the cubit sends forth more propagations, the first Z, the second 2, the third J. Then another in its progresse N. The remainder ends in the wrist 31.
 32. 1. The fifth that enters the arm, which about the inner protuberation of the arm, is disseminated like to the third. Its first surcle 33, its second 34, its third 35.
 36. 1. The sixth nerve of the arm, which goes under the skin imparting many sprigs to it 37, 37. 37. The end of it is 38.
 20. 21. The five pairs of the nerves of the loins: the first 20, the second 21, the third 22, the fourth 23, the fifth 24. A certain branch arising from the first pair of the loins 20, and descending for the most part with the preparing artery to the testicle.
 22, 23. The course of the nerves through the muscles of the Abdomen; from which branches 41 goes to the muscle that leads the arm outward from the breast.
 24. 1. The hinder branches of the nerves of the loins.
 39. 1. The six pairs of the nerves of the great bone. Of these the first is 25, the second 26, the third 27, the fourth 28, the fifth 29, the sixth 30.
 40. 1. A Surcle reacht out from the fore-branch of the first nerve of the great bone to the inside of the hanch bone, and so to the muscles of the abdomen, that arise from that bone. Then another spreading out from the hinder-branch to the muscles seated on the back of os Illium, or the hanch-bone.
 41. 1. The termination of the spinall marrow passing on without a mate, and undivided.
 42. 2. The first nerve entering the crus. This arises where the third nerve of the loins meets with the fourth 47. A branch of this 48 goes to the skin; but 49 it is entangled among the muscles, that are seated on the outside of the thigh.
 43. 1.
 44. 2.
 45. 1.
 46. 1.
 47.
 48. 1.
 49. 1.

50. 1. The second crural nerve, a notable propagation whereof 51 runs out in the same course with the vein Saphena to the end of the foot, and there ends about 52. In the mean time it proffers another notable surcle 53 to the fore-side of the knee. But the remainder of the trunk 54 enters deep into the thigh, and gives out a small branch 55, but without question the chief.
 51. 1.
 52. 1.
 53. 1.
 54. 1.
 55. 1.
 56. 1. The third crural nerve, whose propagation 57 goes to the muscles called Obturators, and another 58 to the skin. The remainder 59 lies deep intangled in the muscles whose chief propagation is 60, which is implanted into the second and third muscles, that bend the Leg.
 57. 1.
 58. 1.
 59. 1.
 60. 1.
 61. 1. The fourth, and that the thickest of all the nerves of the crus, whose first branch is 62, which is inserted into the skin of the buttocks; another 63 is distributed into the heads of the muscles that arise from the appendix of the Hip: a third 64 is given to the fifth muscle, that bends the leg; and others 65 go into the outer calf-muscle, and that of the sole of the foot. But about the lower heads of the thigh it is divided 66 into two branches, to wit, an outer one, 67, and an inner 72.
 62. 1.
 63. 1.
 64. 1.
 65. 1.
 66. 1.
 67. 1.
 68. 1. The outer branch, a propagation whereof 68 is sent under the skin, that covers the outer part of the leg, and the outside of the foot. But the branch itself 69 goes to the connexion of the lesser bone of the leg with the greater; sending forth another surcle 70 to the fore-part of the leg under the skin: the remainder of it 71 reaches along the fibula or lesser bone of leg.
 69. 1.
 70. 1.
 71. 1.
 72. 1.
 73. 1. The inner branch a propagation whereof, 73 goes through the inside of the leg toward the calf, and inside of the foot under the skin: and then another 74 is scattered into the skin, especially that which covers the calf.
 74. 1.
 75. 75. 1. Another also 75, 75 goes into the fore-part of the leg through the ligament that joins the lesser bone of the leg to the greater, and afterward is spent on the upper side of the foot. The last propagation 76 runs out betwixt the inner and outer calf-muscles. The remainder of the trunk goes by the inner ankle to the lower part of the foot, distributing two surcles a peice to the lower part of all the toes.
 76. 1.
 77. 1. The second and third figures of the second Table. These two figures do exhibit the nerves of the arm and leg in a larger form, then the first table does, so that all, which concerns those nerves, may be shew'n more accurately herein. But they have common characters, and the same explanation of the same serves for both.

